

INPUT METHODOLOGIES (ELECTRICITY DISTRIBUTION AND GAS PIPELINE SERVICES)

REASONS PAPER

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COMMERCE COMMISSION

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Commerce Commission

Foreword

The Commission has been entrusted with new regulatory functions under Part 4 of the Commerce Act. In key markets in which competition is limited, our central purpose is to promote the long-term benefit of the consumers of regulated services. This will be achieved by promoting outcomes consistent with those produced in workably competitive markets, where such outcomes provide incentives to suppliers to innovate, invest and improve their efficiency and reward both suppliers and consumers with a share of the efficiency gains created.

This work is important as it will directly affect essential infrastructure central to New Zealand's future economic prosperity, namely: gas pipelines, electricity lines and airport services.

Input methodologies promote certainty for suppliers and consumers in relation to the rules, requirements and processes applying to regulation under Part 4 of the Commerce Act. Increased regulatory certainty is critical for fostering efficient investment.

This has been a challenging exercise. We have been working with new and untested legislation, and have grappled with a range of issues for which there is no single 'right' answer. While we can look to regulatory regimes in other countries for guidance, there are significant differences between the New Zealand and overseas regimes. Ultimately, our key touchstone has been the purpose statement for Part 4, which is itself unique.

In determining the input methodologies, we have drawn on our collective expertise in economics, finance, law and accounting, as well as practical commercial experience. Where necessary, the Commission has applied its judgement to appropriately balance the interests of suppliers and consumers.

The Commission has benefited from the engagement with interested parties as we have moved through an extensive and robust consultation process for the last two years. We have been assisted by the views of a range of experts in economic regulation and other related matters, including those assisting submitters, and two panels of international experts convened by the Commission – one on matters relating to the cost of capital and the other, primarily, on matters regarding asset valuation, cost allocation and taxation.

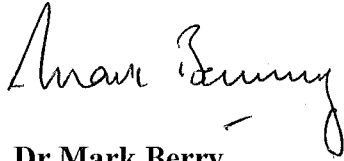
In reaching our decisions, we have carefully considered the full range of options before the Commission. The two most controversial issues in developing input methodologies for electricity distribution and gas pipeline services have been the valuation of the assets used to supply regulated services at the start of the Part 4 regime, and estimating the cost of capital.

In the case of asset valuation, all regulated suppliers have strongly argued for asset valuations at the start of the Part 4 regime that are likely to be significantly higher than the regulatory valuations already in place. In the case of electricity distribution businesses, adopting this approach could legitimise price increases that would, based on what we believe to be a very conservative assessment, result in transfers from consumers to suppliers of almost \$2 billion for no corresponding benefit. The Commission was not convinced by this proposition.

The Commission has tested the reasonableness of its input methodologies for the cost of capital and found that they produce cost of capital estimates commensurate with a range of

commercial measures. We consider they are set in a way that provides an appropriate balance between incentives to invest and limiting suppliers' ability to extract excessive profits.

Overall, we are satisfied that the package of input methodologies determined today, will, when applied to information disclosure and default/customised price-quality regulation, best meet the purpose statement under Part 4 of the Commerce Act. These input methodologies will provide a strong foundation for delivering the long-term benefits to consumers envisaged by Parliament when it enacted Part 4.



Dr Mark Berry

Chair



Sue Begg

Deputy Chair



Pat Duignan

Commission Member



Peter JM Taylor

Commission Member

22 December 2010

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GLOSSARY OF TERMS, ABBREVIATIONS AND DEFINITIONS

Abbreviation	Definition
ABAA	Accounting based allocation approach
ABC	Activity Based Costing
ACAM	Avoidable Cost Allocation Methodology
ACCC	Australian Competition and Consumer Commission
ACG	Allen Consulting Group
Act, The	Commerce Act 1986
AECT	Auckland Energy Consumer Trust
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AIAL	Auckland International Airport Ltd.
Air NZ	Air New Zealand Ltd.
AMPs	Asset Management Plans
Asset Valuation Report	Yarrow, G., Cave, M., Pollitt, M., Small, J., <i>Asset Valuation in Workably Competitive Markets - A Report to the New Zealand Commerce Commission</i> , May 2010
AVDA	Asset Values Directly Attributable
AVnDA	Asset Values Not Directly Attributable
BARNZ	Board of Airline Representatives New Zealand
BBAR	Building Blocks Allowable Revenues
CAA	Commerce Amendment Act 2008
Capex	Capital Expenditure
CAMSC	Cost Allocation Methodology Screening Criteria
CAPM	Capital Asset Pricing Model
CDA	Costs Directly Attributable
CnDA	Costs Not Directly Attributable
CEG	Competition Economists Group
CEO	Chief Executive Officer
CIAL	Christchurch International Airport Ltd.
Commission, The	Commerce Commission
CPI	Consumer Price Index
Consumer-owned EDBs	EDBs that are exempt under s 54G(2) from default price-quality regulation because those EDBs meet the definition of being 'consumer-owned' as defined in s 54D
COS	Cost-of-service
CPI-X	CPI minus X
CPP	Customised Price-Quality Path
CRA	CRA International (formerly Charles River Associates)
DAC	Depreciated Annual Cost

Abbreviation	Definition
DCF	Discounted Cash Flow
Dedicated Assets	Assets constructed in order to meet a fixed-term contract with a specific customer
DHC	Depreciated Historic Cost
DPP	Default Price-Quality Path
Draft Expert Review	An individual independent expert review of the Commission's draft decisions for IMs as set out in the Draft Reasons Papers for EDBs and GPBs by the Commission's expert economic advisors
Draft IMs	Draft IM Determinations
DRC	Depreciated Replacement Cost
EBIT	Earnings before Interest and Tax
EBITDA	Earnings before Interest, Tax and Amortisation
EBSS	Efficiency Benefit Sharing Scheme
ECM	Efficiency Carryover Mechanisms
EDBs	Electricity Distribution Businesses
EDS	Electricity Distribution Services
EIRA	Electricity Industry Reform Act 1988
ELBs	Electricity Lines Businesses
EMCa	Energy Market Consulting associates
ENA	Electricity Networks Association
EnDBs	Electricity Distribution Businesses
ESC	Essential Services Commission
EV	Economic Value
Expert Panel	Cost of Capital Expert Panel
Experts	The Commission's independent expert economic advisors for IMs
Explanatory Note to the Bill	The Explanatory Note to the Commerce Amendment Bill 2008
Farrier Swier	Farrier Swier Consulting Limited
FCC	Federal Communications Commission
FCM	Financial Capital Maintenance
FDC	Fully Distributed Cost
FDC	Finance During Construction
FERC	Federal Energy Regulatory Commission
Final Expert Review	An individual independent expert review of the Commission's updated draft decisions for IMs for EDBs and GPBs by the Commission's expert economic advisors prior to it determining the IMs
GAAP	Generally Accepted Accounting Practice
Gas Authorisation	Commerce Act (Powerco Natural Gas Services) Authorisation 2008, Commission Decision No. 656; and Commerce Act (Vector Natural Gas Services) Authorisation 2008, Commission Decision No. 657
Gas ID Regulations	Gas (Information Disclosure) Regulations 1997

Abbreviation	Definition
GDN	Gas Distribution Network
GDPCR	Gas Distribution Price Control Review Final Proposals
GPBs	Gas Pipeline Businesses
GFC	Global Financial Crisis
GIC	Gas Industry Co. Limited
GPS	Government Policy Statement
GST	Goods and Services Tax
GTBs	Gas Transmission Businesses
HC	Historic Cost
HP	High Pressure
IC	Incremental Cost
IBES	Institutional Brokers' Estimate System
ICP	Installation connection points
ID	Information Disclosure
ID Discussion Paper	Information Disclosure Discussion Paper, 29 July 2009
IDV	Information Disclosure Valuations
IFRS	International Financial Reporting Standards
IHC	Indexed Historic Cost
IM Discussion Paper	Input Methodologies Discussion Paper, 19 June 2009
IMs	Input Methodologies
IP	Intermediate Pressure
IPP	Individual Price-Quality Path
IPART	Independent Pricing and Regulatory Tribunal of New South Wales
IR	Instantaneous Reserves
IRD	Inland Revenue Department
IRIS	Incremental Rolling Incentive Scheme
IRR	Internal Rate of Return
LECG	Law and Economics Consulting Group LLC
LIBOR	London Interbank Offered Rate
LRMC	Long Run Marginal Cost
MAR	Maximum Allowable Revenues
MCE	Ministerial Council on Energy (Australia)
MDL	Maui Development Limited
MEAs	Modern Equivalent Assets
MED	Ministry of Economic Development
MEUG	Major Electricity Users' Group
MP	Medium Pressure
MPOC	Maui Pipeline Operating Code

Abbreviation	Definition
MRP	Market Risk Premium
NIC	New Investment Contract
NEM	National Electricity Market
NER	Australian National Electricity Rules
NERA	National Economic Research Associates
NGC	Natural Gas Corporation
NPV	Net Present Value
NZAA	New Zealand Airports Association
NZIER	New Zealand Institute of Economic Research
NZS	New Zealand Standard
OCDA	Operating Costs Directly Attributable
OCnDA	Operating Costs Not Directly Attributable
ODRC	Optimised Depreciated Replacement Cost
ODV	Optimised Deprival Valuation
OECD	Organisation for Economic Co-operation and Development
OEM	Original equipment manufacturer
Ofcom	Office of Communications, UK
Ofgem	Office of the Gas and Electricity Markets, UK
Ofgreg	Office for the Regulation of Electricity and Gas, UK
Oftel	Office of Telecommunications
Ofwat	Water Services Regulation Authority, UK
Opex	Operating Expenditure
Order, The	Commerce (Control of Natural Gas Services) Order 2005
ORC	Optimised Replacement Cost
ORR	Office of Rail Regulation, UK
OVABAA	Optional variation to the accounting based allocation approach
Paper, The	Commerce Commission, <i>Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper</i> , 22 December 2010
Part 4 Purpose	Purpose of Part 4, set out in section 52A of the Act
PBA	Parsons Brinkerhoff Associates
PBR	Performance Based Regulation
PIE	Portfolio Investment Entity
Post-tax cost of capital	Where the cost of debt is adjusted down by an interest tax deduction, and the company is remunerated for its (un-levered) tax liabilities through a cash flow allowance.
Price control	Control of prices, revenues and/or quality standards
Provisions Paper	Commerce Commission, <i>Regulatory provisions of the Commerce Act 1986 – Discussion paper</i> , 19 December 2008
PV	Present Value
PwC	PricewaterhouseCoopers

Abbreviation	Definition
QCA	Queensland Competition Authority
QCMA	Queensland Co-operative Milling Association Limited
Quality Standard Variation	Variation to the quality standards under a DPP
Quality-only Proposal	A standalone CPP proposal for a quality standard variation only
RAB	Regulatory Asset Base
RCPI	First Regulatory Control Period
RDG	Revised Draft Cost of Capital Guidelines
Reserve Bank	Reserve Bank of New Zealand
RIV	Regulatory Investment Value
ROI	Return on investment
RPI-X	Retail Prices Index minus X
S&P	Standard and Poors
SAC	Stand Alone Cost
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCP	Structure – Conduct – Performance
SKM	Sinclair Knight Merz
SBL	Simplified Brennan-Lally
SPA	Starting Price Adjustment
SRMC	Short Run Marginal Cost
SSNIP	Small but significant and non-transitory increase in price
Strata	Strata Energy Consulting Limited
Submissions Review	Yarrow, G., Cave, M., Pollitt, M., Small, J., <i>Review of Submissions on Asset Valuation in Workably Competitive Markets - A Report to the New Zealand Commerce Commission</i> , November 2010
TAMRP	Tax-adjusted Market Risk Premium
Thresholds regime	Targeted control regime under Part 4A of the Commerce Act
TPM	Transmission Pricing Methodology
TSO	Telecommunications Service Obligations
UK	United Kingdom
UK CAA	UK Civil Aviation Authority
US	United States
Vanilla cost of capital	Where the corporate tax shield provided by debt capital is ignored in the cost of capital calculation, and firms are remunerated for their levered tax liabilities through a cash flow allowance.
Vector (Auckland)	In the case of Vector, the gas pipeline services supplied under the Gas Authorisation
VIX	Volatility Index – a measure of investor expectations of near-term

Abbreviation	Definition
	volatility.
VTC	Vector Transmission Code
WACC	Weighted Average Cost of Capital
WIAL	Wellington International Airport Ltd.

EXECUTIVE SUMMARY

Introduction

Purpose of this Paper

X1 The Commerce Commission (Commission) has determined input methodologies (IMs) for electricity lines services and gas pipeline services under Part 4 of the Commerce Act 1986 (the Act). Part 4 provides for the regulation of the price and quality of goods or services supplied in markets where there is little or no competition, and little or no likelihood of a substantial increase in competition (s 52). IMs set out the rules, requirements and processes applying to the regulation of those services. In accordance with s 52W, the Commission's reasons for these IMs will be set out in the relevant Gazette notices that publish the IMs. This Reasons Paper (Paper) expands on those reasons.

Regulated services discussed in this Paper

X2 This Paper discusses the IM Determinations that have been made by the Commission in respect of:

- electricity lines services other than those supplied by Transpower ('electricity distribution services')—currently supplied by 29 electricity distribution businesses (EDBs);
- gas pipeline services defined as 'gas transmission services'—currently supplied by Maui Development Ltd (MDL) and Vector (i.e. 'gas transmission businesses' or GTBs); and
- all other gas pipeline services ('gas distribution services')—currently supplied by Powerco, GasNet, and Vector (i.e. 'gas distribution businesses' or GDBs).

Part 4 Regulatory Framework

Purpose and application of IMs

X3 The purpose of IMs is to promote certainty for suppliers and consumers in relation to the rules, requirements and processes applying to the regulation, or proposed regulation, of goods and services under Part 4 (s 52R). IMs must include certain matters, to the extent applicable to the type of regulation (s 52T). The IMs that apply to electricity distribution services and gas pipeline services depend on the 'regulatory instruments' that apply to those services—i.e. information disclosure, default price-quality paths (DPPs) and customised price-quality paths (CPPs).

Purpose and application of types of regulation

X4 EDBs and gas pipeline businesses (GPBs, i.e. GTBs and GDBs) are subject to information disclosure regulation—the purpose of which is to ensure that sufficient information is readily available to interested persons to assess whether the purpose of Part 4 is being met (s 53A).

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- X5 EDBs that are not ‘consumer-owned’, and all GPBs, are also subject to default/customised price-quality regulation—the purpose of which is to provide a relatively low-cost way of setting price-quality paths for suppliers of regulated services, while allowing the opportunity for individual regulated suppliers to have alternative price-quality paths that better meet their particular circumstances (s 53K).
- X6 Information disclosure regulation and default/customised price-quality regulation are given effect through s 52P determinations made by the Commission. A s 52P DPP determination is currently in force for EDBs from April 2010 to March 2015. The Commission intends consulting during 2011 on whether, and if so how, those DPPs should be reset, now that the IMs for EDBs have been determined (s 54K(3)). The Commission also intends consulting during 2011 on the initial DPP determination for GPBs and on information disclosure determinations for EDBs and GPBs.

Scope of IMs

- X7 In light of the purpose of the relevant regulatory instruments, and the purpose of Part 4, the Commission has determined IMs for:
- the allocation of costs to regulated services supplied by the EDBs and GPBs;
 - the valuation of assets that are used to supply regulated services;
 - the treatment of tax costs for regulatory purposes;
 - estimating the cost of capital;
 - pricing methodologies (for GPBs only);
 - rules and processes that set out how price-quality regulation operates, including:-
 - how price is specified;
 - circumstances in which price-quality paths may be reconsidered within a regulatory period;
 - how a rolling incentive mechanism will operate for suppliers on a CPP;
 - the aggregation of price-quality paths after an amalgamation between suppliers of the same regulated service; and
 - matters relating to CPP proposals.

Part 4 Purpose

- X8 The central purpose of Part 4 is to promote the long-term benefit of consumers in markets where there is little or no competition and little or no likelihood of a substantial increase in competition (s 52A(1)). To achieve this, the Commission must promote outcomes in regulated markets that are consistent with those produced in competitive markets (to the extent relevant to markets with limited or no competition), such that regulated suppliers:
- a. have incentives to innovate and to invest, including in replacement, upgraded, and new assets (s 52A(1)(a));
 - b. have incentives to improve efficiency and provide services at a quality that reflects consumer demands (s 52A(1)(b));

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- c. share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices (s 52A(1)(c)); and
- d. are limited in their ability to extract excessive profits (s 52A(1)(d)).
- X9 ‘Competition’ in Part 4, as in the rest of the Act, means ‘workable or effective competition’ (s 3(1))—hereafter ‘workable competition’. Workable competition exists when there is an opportunity for sufficient influences to constrain the market power of suppliers (e.g. rivalry amongst existing suppliers, the threat of substitute goods and services, the threat of new entrants, or the buying power of consumers).
- X10 The regulatory objectives in (a)-(d) of s 52A(1) reflect performance criteria that characterise workable competition.
- *Prices and quality.* In workably competitive markets, suppliers have incentives to constrain price and maintain or improve quality—as they otherwise would lose customers because price and quality are the two key aspects of goods and services that are often of most interest to consumers.
 - *Investment.* In workably competitive markets, suppliers have incentives to undertake investments at an efficient level at the optimal time (to the extent these levels and time can be ascertained).
 - *Innovation.* Workably competitive markets promote the discovery and use of new information, leading to the development of new goods/services, and more efficient production techniques.
 - *Efficiency.* The promotion of allocative, productive and dynamic efficiency is a key feature of workably competitive markets. Efficiency gains are shared with consumers through lower prices, and/or better service quality, over time.
 - *Profits.* In workably competitive markets, profits are just sufficient to reward investment, efficiency and innovation. Superior performers are more likely to be rewarded by receiving returns greater than a ‘normal profit’ (or ‘normal return’—i.e. their risk-adjusted cost of capital), at least for the short to medium term, until competitors catch up. Over the lifetime of its assets, a typically efficient supplier would not invest unless it expected, in advance, to earn at least a normal return.

Relevance and application of IMs

- X11 It is in combination with each other, and with other requirements in a s 52P determination for information disclosure or price-quality regulation, that IMs provide incentives for regulated suppliers to act in a manner consistent with the Part 4 Purpose.
- X12 The key relevance of the IMs to the objectives in the purpose of Part 4 includes the factors highlighted in Table X1 below.

Table X1: Key Relevance of Input Methodologies to Regulatory Objectives

Methodology	Key Regulatory Objectives	Relevance
Cost allocation— s 52T(1)(a)(iii)	Section 52A(1)(c) and (a)	The way that costs are allocated between regulated and/or unregulated services has an important bearing on how efficiency gains are shared with consumers of regulated services over time, as well as on the extent to which investment by regulated suppliers in the provision of other services is unduly deterred (also refer s 52T(3)).
Asset valuation, depreciation and revaluations— s 52T(1)(a)(ii)	Section 52A(1)(a) and (b)	The way that the value of the regulatory asset base (RAB) is rolled forward affects how regulated suppliers recover the investments that they make, which in turn affects the incentives to invest that they face.
Asset valuation— s 52T(1)(a)(ii)	Section 52A(1)(d)	The level of the ‘initial’ value of RAB (i.e. at the beginning of the Part 4 regime), is far less significant to incentives for investment or efficiency than the way that the value of the RAB is rolled forward, but it has a notable bearing on whether regulated suppliers are limited in their ability to extract excessive profits from consumers in future.
Treatment of tax— s 52T(1)(a)(iv)	Section 52A(1)(d)	The treatment of tax also has an impact on whether regulated suppliers are limited in their ability to extract excessive profits from consumers in future.
Cost of capital— s 52T(1)(a)(i)	Section 52A(1)(a) and (d)	The cost of capital will have an impact on whether financial capital is being maintained, and whether regulated suppliers are limited in their ability to extract excessive profits.
Pricing methodologies— s 52T(1)(b) & (a)(iii)	Section 52A(1)(b)	Pricing methodologies primarily have a bearing on allocative efficiency.
Rules and processes— s 52T(1)(c)	Section 52A(1)(a) and (b)	Rules and process will promote certainty, contributing to an environment conducive to investment, and the incremental rolling incentive scheme (IRIS) is specifically intended to promote operational efficiencies.
Matters relating to CPP proposals— s 52T(1)(d)	Section 52A(1)(a), (b) and (d)	The requirements for CPP proposals, and the evaluation criteria used by the Commission to assess those proposals, will ensure that regulated suppliers are able to recover their costs of efficient investment and operation over the CPP regulatory period.

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- X13 With the exception of pricing methodologies, the above IMs are key inputs to:
- the calculation or assessment of financial information disclosure requirements; in particular, the return on investment (ROI) for EDBs and GPBs;
 - starting price adjustments for DPPs (through information provided by suppliers that is consistent with the IMs in s 52T(1)(a)); and
 - the calculation of allowable revenue under CPPs.

Overview of the Input Methodologies

Cost Allocation IM

- X14 The cost allocation IM sets out the methodology for allocating asset values (which drive capital costs) and operating costs between regulated services, and between regulated services and unregulated services (in aggregate). The IM allocates all costs associated with the supply of regulated services, thereby implicitly allocating all costs that are common to two or more types of services (whether regulated or unregulated). This approach avoids having to explicitly identify and allocate common costs, which can be a difficult exercise given that such costs can be defined and measured in different ways.
- X15 The IM requires a two-step allocation of operating costs and asset values:
- **allocation of costs ‘directly attributable’**: (i.e. operating costs and asset values that are wholly and solely associated with the provision of electricity distribution, gas distribution or gas transmission services) to the type of services to which they are directly attributable; and
 - **allocation of costs ‘not directly attributable’**: (i.e. operating costs and asset values that are associated with the provision of two or more types of regulated, or both regulated services and unregulated services in aggregate) by specifying the approach for determining the proportion of such costs it would be appropriate to recover from the type or types of regulated services with which they are associated.
- X16 The IM provides for three complementary approaches for allocating costs not directly attributable to regulated services. Doing so recognises that a single approach might not necessarily be able in all circumstances to move outcomes closer to those produced in workably competitive markets; or satisfy the requirement in s 52T(3) that any IM for allocating common costs must not unduly deter investment by a regulated supplier in the provision of other goods or services.
- The **accounting-based allocation approach (ABAA)** requires not directly attributable operating costs and asset values to be allocated based on causal factors, or based on proxy factors where causally based allocators are not available. In many circumstances this approach is expected to move the allocation of costs closer to that in workably competitive markets, in which costs common to the supply of two (or more) types of services are borne by all

of those types of services. Doing so ensures that the benefits of efficiency gains that arise from the joint supply of two or more types of services are shared with consumers of the relevant types of regulated services over time, consistent with s 52A(1)(c). Regulated suppliers retain some of the benefits of efficiency gains—including those from mergers or acquisitions with suppliers of other types of services—by being able to outperform their DPP or CPP.

- The **optional variation to the accounting-based allocation approach (OVABAA)** allows suppliers to allocate a greater proportion of common costs to regulated services than would occur under ABAA, and is appropriate in situations where the application of ABAA might unduly deter investments in unregulated services. This reflects outcomes produced in workably competitive markets where some services may, for a period, bear most of the common costs while others bear little (e.g. during the start-up phase of a new service).
- The **avoidable cost allocation methodology (ACAM)** requires all common costs associated with a particular type of regulated service to be allocated to that service, and is therefore only appropriate where regulated and unregulated services have a small amount of costs in common. In such cases, the use of either ABAA or OVABAA might not move outcomes materially closer to those in workably competitive markets than would occur under ACAM.

Asset Valuation IM

Initial valuation

- X17 Under Part 4, the initial value of the RAB for all EDBs and GPBs will be established with reference to the most recent regulatory values that have been permitted for each supplier prior to the start of the Part 4 regime. These valuations reflect the long-term relationships between suppliers and their consumers that have been shaped by many years of regulatory arrangements.
- X18 No factual evidence has been submitted to suggest that reference to existing regulatory valuations would prevent suppliers from having the opportunity to earn at least a normal return *on and of* the original cost of installing assets. This valuation approach should therefore give regulated suppliers no concern about the recovery of future investments. The approach is thus consistent with s 52A(1)(a).
- X19 New replacement (i.e. new build) cost-based valuations are not required by the reference to workably competitive markets in the Part 4 Purpose, and are less aligned to that purpose than existing regulatory valuations.
- X20 If regulated suppliers were permitted to increase their prices to reflect a change in replacement cost, without the revaluation gain being treated as income, regulated suppliers would not be limited in their ability to extract excessive profits. This would be unlikely to be consistent with s 52A(1)(d).
- X21 Likewise, write-downs of prior regulatory values of specialised assets should be avoided insofar as this may set a precedent that damages a supplier's incentives to invest in future.

Rolling forward the RAB value over time

- X22 The value of the RAB is ‘rolled forward’ each year for capital additions (i.e. the value of commissioned or acquired assets), asset disposals, depreciation, and revaluations (i.e. indexation by the Consumer Price Index (CPI)). CPI-indexation will ensure that the value of each supplier’s investments will not be eroded by the effects of inflation. These revaluations affect the level of profits that suppliers can expect in future. Thus to appropriately account for the longer term profitability effects of asset revaluation any gains (or losses) that arise as a result of asset revaluations are to be treated as income (or losses) when setting or monitoring prices.
- X23 The value of the RAB will be depreciated year-on-year on a straight-line basis using physical asset lives. This is the standard approach for calculating depreciation. Suppliers may apply alternative depreciation approaches under a CPP where the Commission is satisfied that, given the supplier’s particular circumstances, the alternative better meets the Part 4 Purpose than the standard depreciation approach.

Tax IM

- X24 The treatment of taxation must be consistent with suppliers expecting to earn profits that are consistent with the profits that would be expected in a workably competitive market. In workably competitive markets, it is profits after tax that would on average be expected *ex ante* to be sufficient to reward investment, innovation and efficiency.
- X25 Compared to the alternatives, the tax payable approach comes closest to approximating the cash flows a supplier would need to meet their tax obligations for any given period, and this approach applies to the GTBs. A tax expense approach with a deferred tax balance adjustment to the RAB value—which makes the approach equivalent in net present value (NPV) terms to the tax payable approach—applies to all EDBs and GDBs. The two approaches are NPV-equivalent over time, so the difference in application takes into account the preference of GTBs for tax payable, and of EDBs and GDBs for deferred tax.

Cost of Capital IM

- X26 The cost of capital reflects the cost of debt and the cost of equity. The cost of capital, in particular the cost of equity, cannot be observed directly. Rather the individual components of the cost of capital must be estimated. Judgement is required in determining what tools and techniques should be used, what the level of individual parameters should be, and what adjustments may be required to ensure the resulting estimate of the cost of capital is reasonable.
- X27 The cost of debt is estimated by reference to the risk-free rate (proxied by yields on Government bonds), plus a debt premium for the greater risk on corporate debt, and the costs of issuing debt.
- X28 The term of the risk-free rate is to match the length of the regulatory period, typically five years. This is to ensure that suppliers can expect (*ex ante*) to earn a normal return, consistent with outcomes in workably competitive markets, such that suppliers are compensated for the interest rate risks they bear and are not over- or under-compensated (depending on the shape of the yield curve), which could occur

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- if a longer term was chosen. The alignment of the term of the risk-free rate with the regulatory period is compatible with other possible objectives such as longer term borrowing, given the availability and widespread use of interest rate swaps which allow suppliers to reset their interest rate repricing period to shorter terms (and the ability to match the regulatory period if desired), even if the supplier has issued debt with a long original maturity date (for example, 10 years).
- X29 The debt premium is calculated by reference to publicly traded bonds with a Standard and Poors' long-term credit rating of BBB+ and an original term which is greater than the regulatory period (typically five years). Allowance is made for those additional costs of issuing longer maturity debt that cannot be managed through swaps, where regulated suppliers have in fact issued such debt.
- X30 Confidential information provided by regulated suppliers with respect to their actual margins and costs has been used to confirm that the estimates of the cost of debt under the IM are a realistic estimate of the cost of debt finance for a regulated supplier issuing bonds with a BBB+ rating.
- X31 The IM uses the simplified Brennan-Lally Capital Asset Pricing Model (CAPM) to estimate the cost of equity. This model best fits the particular features of the New Zealand taxation system, and is so widely used in New Zealand that there is currently no credible alternative.
- X32 The IM assumes that the tax-adjusted market risk premium for owning a portfolio of New Zealand equity investments of average risk will average 7%. This reflects estimates from a range of sources reflecting both historical and forecast estimates of the return on equity investments with average risk. It is consistent with the average assumption used by New Zealand investment banks. An uplift to 7.5% is proposed until 2011 to take into account the impacts of the global financial crisis.
- X33 Suppliers of services regulated under Part 4 have relatively lower exposure to market risk than most New Zealand companies because they are suppliers of essential services which are less affected by the state of the economy. This relative risk relationship compared to the overall share market is represented by beta. Using data from 79 listed utilities in New Zealand, Australia and the US, the Commission has estimated the asset beta for EDBs (and Transpower) at 0.34. The Commission's estimate is in the middle of the range of asset betas adopted by other regulators for regulated energy utilities. The asset beta for GPBs has been set at 0.44 because the Commission considers that New Zealand GPBs have higher risk than New Zealand EDBs and offshore gas companies.
- X34 Leverage is 44%, in line with the average leverage of the international survey of 79 listed utility companies. (The result is the same whether the two listed New Zealand regulated energy entities are included or excluded from the sample.) Applying that leverage to the asset beta results in an equity beta of 0.61 for EDBs (and Transpower), and 0.79 for GPBs.
- X35 For application to DPPs and CPPs, the IM specifies that the 75th percentile of the estimated WACC distribution should be used. This is higher than the mid-point estimate of the cost of capital, but the Commission considers this choice is prudent

to ensure, by allowing for possible errors in the estimation of WACC, that regulated suppliers have incentives to invest, because efficient investment is to the long-term benefit of consumers.

- X36 The Commission has tested the estimates of the cost of capital produced by the cost of capital IM to ensure it is reasonable and commercially realistic. In particular, the Commission has tested its estimate against independent estimates of the cost of capital in New Zealand, against regulatory decisions (especially in the UK and Australia), and against historic and expected returns for the New Zealand market.
- X37 These tests confirm that the IM provides estimates of the cost of capital that are expected to provide suppliers of regulated services with sufficient returns to incentivise innovation and investment, while ensuring suppliers are limited in their ability to extract excessive profits.

Pricing Methodologies IM

- X38 Given the responsibilities that the Electricity Authority has in respect of pricing methodologies for EDBs, the Commission has decided to set an IM for pricing methodologies for GPBs, but not for EDBs.
- X39 The pricing methodologies are based on principles of efficient pricing, and are consistent with the Gas Authorisation, with some minor modifications to ensure consistency with Part 4.
- X40 The IM will apply to GPBs under a CPP, but only to those GPBs that the Commission has specifically identified as needing to do so in its most recent summary and analysis of information disclosures.

Rules and Processes IMs

Specification of price

- X41 The key component of the IM for the specification of price is the ‘form of control’ that is used to cap revenues or prices under default/customised price-quality regulation.
- X42 For EDBs and GDBs, where multiple services are supplied and where demand can be influenced to a reasonable extent by the supplier, price will be specified by a weighted average price cap. For GTBs, the IM describes how the Commission will allow for the supplier’s business profile when determining whether to apply a total revenue cap or weighted average price cap.
- X43 The IMs include a list of pass-through costs and a process for adding new pass-through costs as well as a list of recoverable costs for each service. The main distinction between these two categories is the extent to which they are controllable by the regulated supplier. Pass-through costs are those costs that are outside the control of the supplier. Recoverable costs may also be passed through to prices, but subject to an approval process.
- X44 Pass-through costs include local authority rates and regulatory levies. Recoverable costs include costs associated with making a CPP proposal; for EDBs they include

transmission charges, new investment contract charges, and avoided transmission charges; and for GTBs they include costs or credits associated with the sale or purchase of balancing gas.

Circumstances in which price-quality paths may be reconsidered

- X45 The Commission sets price-quality paths on an *ex ante* basis for a 3 to 5 year period. To maximise incentives for suppliers to behave efficiently, the rules on when a price-quality path may be reconsidered should, where possible, be clearly specified.
- X46 For all services, a DPP or a CPP may be reconsidered if a material error is discovered in the determination, or if a supplier has provided false or misleading information to the Commission, which the Commission has relied upon in making its determination. In addition, a CPP may be reconsidered if a catastrophic event imposes material costs, or if changes in legislative or regulatory requirements materially affect costs.
- X47 A GTB's CPP may also be reconsidered if a trigger event occurs for a project on the contingent project list, or an unforeseen project has commenced or is committed to take place during a CPP regulatory period.

Incremental rolling incentive scheme

- X48 To provide suppliers with incentives to pursue efficiency gains throughout the regulatory period, the Commission has decided to implement an incremental rolling incentive scheme (IRIS) under a CPP. The IRIS allows EDBs and GPBs to retain efficiency gains in controllable operating expenditure for five years spanning regulatory periods.
- X49 The IRIS requires reliable cost forecasts and will therefore not apply to suppliers under a DPP.

Aggregation of price-quality paths following an amalgamation

- X50 When regulated suppliers of the same type of service amalgamate, price-quality paths must also be amalgamated, but they will not be reset before the end of the current regulatory period.

IMs Relating to CPPs

- X51 A supplier that is subject to a DPP may make a proposal to the Commission for a CPP to better meet its particular circumstances. The IMs specify the required elements of the proposal (including the information required, the extent of independent verification, and the extent of consultation and agreement with consumers), and the criteria that the Commission will use to evaluate any proposal.
- X52 Determining a CPP is likely to be more costly than determining a DPP. However, the Commission is mindful of the need to minimise the costs of regulation, while still promoting the Part 4 Purpose. Therefore, it has sought to develop a cost-effective approach to preparing, verifying and evaluating CPP proposals.
- X53 CPPs are based on the use of 'building blocks' analysis, which combines the cost allocation, asset valuation, tax and cost of capital IMs, along with forecasts of capital

expenditure and operating expenditure, to determine the maximum allowable revenue that may be recovered from consumers over the CPP regulatory period. With the exception of circumstances in which the price-quality path is reconsidered during that period, maximum allowable revenue is set *ex ante* and not subsequently adjusted to take account of actual costs during the period.

- X54 The CPP information requirements were developed to support a top-down service-based approach to assessing forecast capital and operating expenditure and a key feature of the Commission's approach is the use of pre-submission verification of the key aspects of a proposal. The Commission's assessment will focus on whether a supplier's policies, strategies and procedures are appropriate, such that services will be provided efficiently and align with consumer demands, and whether those policies, strategies and procedures have been applied.
- X55 As well as assessing a CPP proposal for consistency with the relevant IMs and the extent to which it will promote the Part 4 Purpose, the Commission has included specific evaluation criteria to assess:
- whether information in a proposal is 'fit-for-purpose';
 - the efficiency and prudence of forecast expenditure;
 - the extent to which any proposed quality standard variation better reflects the realistically achievable performance of the supplier over the regulatory period; and
 - the extent of support (or opposition) for a supplier's proposal (given the requirement for suppliers to consult with consumers).

PART 1: REGULATORY FRAMEWORK AND KEY FEATURES OF THE INPUT METHODOLOGIES

CHAPTER 1: INTRODUCTION

1.1 Purpose of this Paper

1.1.1 The Commerce Commission (Commission) has determined input methodologies (IMs) for electricity lines services and gas pipeline services under subpart 3 of Part 4 of the Commerce Act 1986 (the Act).¹ Part 4 provides for the regulation of the price and quality ('economic regulation') of goods or services supplied in markets where there is little or no competition, and little or no likelihood of a substantial increase in competition (s 52). IMs set out the rules, requirements and processes applying to the regulation of those services.

1.1.2 In accordance with s 52W, the Commission's reasons for these IMs will be set out in the relevant Gazette notices that publish the IMs.² This Reasons Paper (Paper) expands on those reasons.

Regulated services discussed in this Paper

1.1.3 Subpart 9 of Part 4 sets out provisions specific to the regulation of electricity lines services and subpart 10 sets out provisions specific to gas pipeline services, including how each service is defined (s 54C (electricity lines) and s 55A (gas pipelines)).

1.1.4 Given various technical, commercial and other differences between the transmission and distribution of electricity and gas, the Commission has decided to make separate IM Determinations in respect of four types of regulated services supplied by electricity lines businesses (ELBs) and/or gas pipeline businesses (GPBs):

- i. electricity lines services that are supplied by Transpower (defined by the Commission as 'electricity transmission services');³
- ii. all other electricity lines services (defined by the Commission as 'electricity distribution services'), which are currently supplied by 29 electricity distribution businesses (EDBs);⁴
- iii. gas pipeline services defined by the Commission as 'gas transmission services', which are currently supplied by Maui Development Ltd (MDL) and Vector (i.e. 'gas transmission businesses' or 'GTBs');⁵ and

¹ Statutory references in this Paper are to the Act unless otherwise specified.

² Section 52W requires the Commission to publish the IMs by way of notice in the Gazette within 10 working days after the Commission determines the IMs.

³ Commerce Commission, *Commerce Act (Transpower Input Methodologies) Determination*, 22 December 2010.

⁴ Commerce Commission, *Commerce Act (Electricity Distribution Services Input Methodologies) Determination*, 22 December 2010.

⁵ Commerce Commission, *Commerce Act (Gas Transmission Services Input Methodologies) Determination*, 22 December 2010.

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- iv. all other gas pipeline services (defined by the Commission as ‘gas distribution services’), which are currently supplied by Powerco, GasNet, and Vector (i.e. ‘gas distribution businesses’ or ‘GDBs’).⁶

1.1.5 This Paper only discusses the IM Determinations that have been made by the Commission in respect of electricity distribution services, gas distribution services and gas transmission services. References to ‘all regulated suppliers’ in this Paper are to suppliers of electricity distribution services, gas distribution services and gas transmission services only. The IM Determinations made by the Commission in respect of regulated services supplied by Transpower and specified airport services supplied at the three major international airports (i.e. Auckland, Wellington and Christchurch International Airports) are discussed in separate papers.⁷

Structure of this chapter

1.1.6 The remainder of this chapter is structured as follows:

- Section 1.2 provides a brief background to Part 4, and highlights some of the key amendments made through the passage of the Commerce Amendment Act 2008 (CAA), and the reasons for those amendments;
- Section 1.3 describes the structure of this Paper; and
- Section 1.4 gives an overview of the process that the Commission has followed in determining the IMs, including consultation undertaken with interested parties and expert advice it has obtained.

1.2 Background to Part 4 of the Commerce Act

Benefits of competition and rationale for economic regulation

1.2.1 In competitive markets, suppliers of goods and services typically have incentives to innovate and to improve efficiency, in terms of both their operational and investment decisions. Suppliers expect to earn profits that at least compensate them for their cost of capital over time. The cost of capital is the financial return investors require (*ex ante*) from an investment given its risk.

1.2.2 Economists refer to the level of profits commensurate with the cost of capital as ‘normal profits’ or ‘normal returns’. Suppliers that achieve a superior performance in competitive markets have the opportunity to earn more than normal returns in the short to medium term. However, these higher profits tend to be competed away as competing suppliers catch up. On the other hand, less efficient suppliers might not be successful, and could end up earning less than normal returns, therefore marking down the value of their assets, and/or ultimately exiting the market.

1.2.3 Competition helps ensure consumers are supplied with a choice of goods and services at the quantity and quality they demand, at an efficient price. Suppliers share efficiency gains with consumers over time by supplying goods and services at

⁶ Commerce Commission, *Commerce Act (Gas Distribution Services Input Methodologies) Determination*, 22 December 2010.

⁷ Commerce Commission, *Input Methodologies (Transpower) Reasons Paper*, 22 December 2010; and Commerce Commission, *Input Methodologies (Airport Services) Reasons Paper*, 22 December 2010.

prices lower than they would be without competition, through improving the quality of existing goods and services, and through an expanded selection of goods and services.

- 1.2.4 Given these widely recognised benefits of competition, competition law in OECD countries typically includes provisions to promote competition, to restrict anti-competitive practices and to limit abuse of ‘market power’. In New Zealand, such provisions are included in Parts 2 and 3 of the Commerce Act.
- 1.2.5 Where competition is limited or absent economic regulation may be appropriate. In markets with ‘natural monopoly’ characteristics, a single supplier can provide services in a particular market (often a particular geographic area) at a lower cost than any combination of two or more suppliers. This is often the case in energy networks (though not for energy generation, wholesaling or retailing), and is sometimes the case for airports (if a single airport would be the most cost efficient way of serving a particular area). Telecommunications, water networks, rail and ports can also exhibit natural monopoly characteristics. Hence, in most OECD countries, some or all of these sectors are subject to some form of economic regulation.
- 1.2.6 Economic regulation is sometimes described as an attempt to ‘mimic’—albeit imperfectly, and using different mechanisms—the competitive process in markets where competition is unlikely to be effective. For instance, in its advice to the Australian Ministerial Council on Energy (‘MCE’), the Expert Panel to the MCE noted that “the policy goal for regulation may be to replicate as far as possible what a competitive market would otherwise deliver.”⁸ Although the Expert Panel acknowledged that “regulation cannot flawlessly mimic the competitive process”, particularly given the existence of asymmetric information between the regulator and regulated entities, it stated that:

The central objective of price control is to constrain the exercise of market power by firms that do not face effective competition for their services. Regulation and, specifically, the periodic determination of maximum prices or revenue is directed at achieving outcomes that could otherwise be expected from effective competition.⁹

- 1.2.7 In New Zealand, generic provisions for economic regulation are included in Part 4 of the Commerce Act. Part 4 also includes sector-specific regulatory provisions relating to energy networks and airports. In addition, other legislation—such as the Telecommunications Act 2001 and the Dairy Restructuring Act 2001—includes sector-specific regulatory provisions.

Types of economic regulation

- 1.2.8 Information disclosure (or regulatory accounting) is the most light-handed type of economic regulation, and can be used to complement other types of regulation. Information disclosure can:

⁸ Expert Panel on Energy Access Pricing, *Report to the Ministerial Council on Energy*, Canberra, Australia, April 2006, p. 11.

⁹ *ibid.*, p. 118.

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- influence regulated suppliers' behaviour by making their performance in supplying regulated services more transparent; and
 - provide the data necessary for implementing other types of regulation and for monitoring the effectiveness of those types of regulation.

1.2.9 Incentive-based price-quality regulation is common for energy network companies in many OECD countries. In the UK and Australia, price-quality regulation for energy network companies typically:

- caps average prices or revenues through a 'CPI minus X' (CPI-X) price or revenue cap/path—the path restricts average prices or revenues from increasing each year by more than the consumer price index (CPI) less an efficiency/productivity factor (termed an 'X factor');
- requires the regulator's decisions on:
 - 'starting' price adjustments ('P₀ adjustments') at the beginning of each 'regulatory period',
 - rates of change ('X factors') for average prices or revenues during the regulatory period—X factors are typically set through 'building blocks analysis' (paragraphs 2.8.5-2.8.20 below) or 'productivity analysis' (paragraphs 2.8.24-2.8.25 below), and
 - the length of regulatory period (often 5 years);
- works by providing certainty to suppliers about acceptable price/revenue levels over the regulatory period, which promotes incentives for investment;
- works by allowing suppliers to keep benefits of efficiency gains until the end of each regulatory period, or for a defined period (e.g. five years) which promotes incentives for efficiency gains to be made, and at the end of the period, the P₀ and X are reset, thereby sharing efficiency gains with consumers;
- works by setting quality standards, to ensure that service quality does not deteriorate in response to any cost cutting made under the CPI-X price path; and
- can in some cases involve quality incentive/penalty schemes, linking quality and price/revenue more explicitly.

1.2.10 Negotiate-arbitrate regulation is sometimes applied where there are a small number of large and well-resourced consumers with some countervailing market power (e.g. a negotiate-arbitrate regime for some airports and their airline customers applies in the UK and Australia).

Recent history of economic regulation in New Zealand¹⁰

1.2.11 From 1986 to 2008, generic provisions in the old Part 4 of the Act (i.e. prior to the CAA) provided for the Commission to undertake inquiries into whether particular goods or services should be subject to ‘price control’ (comprising control of prices, revenues and/or quality standards). Inquiries could result in recommendations to the relevant Minister to impose price control under the old Part 5 of the Act, on the grounds that: (a) those goods or services were or would be supplied in markets in which competition was limited or likely to be lessened; and (b) it was necessary or desirable for those goods or services to be controlled in the interests of persons acquiring those goods or services.

1.2.12 Two inquiries were completed by the Commission under the old Part 4.

- *Airfield activities* at the three major international airports (i.e. Auckland, Wellington and Christchurch International Airports). The Commission’s recommendation to impose price control on relevant services supplied by Auckland International Airport was not accepted by the Minister of Commerce.¹¹
- *Gas pipeline services*. The Commission’s recommendation to impose price control on relevant services supplied by Vector (its Auckland gas network only) and by Powerco was accepted by the Minister of Energy,¹² and led to the Commission making authorisations for the supply of the controlled gas pipeline services under the old Part 5 (and which apply from 2005-2012).¹³ The authorisations create a CPI-X price path and quality standards (Gas Authorisation).

1.2.13 During the 1990s, information disclosure regulations were introduced for:

- electricity lines businesses (ELBs)—i.e. electricity distribution businesses (EDBs) and Transpower—in 1994, under the Electricity Act 1992, administered by the Ministry of Economic Development (MED);
- gas pipeline businesses (GPBs) in 1997, under the Gas Act 1992, administered by MED; and
- the three major international airports in 1999, under the Airport Authorities Act 1966, administered by the Ministry of Transport.

1.2.14 In 2001, a number of sector-specific regulatory provisions were introduced: the Dairy Industry Restructuring Act 2001, the Telecommunications Act 2001, and the now-repealed Part 4A of the Commerce Act. Part 4A of the Act imposed a ‘targeted control’ (or ‘thresholds’) regime and information disclosure regime for all EDBs and

¹⁰ A more detailed review was provided in the Commission’s initial discussion paper on the Part 4 regime: Commerce Commission, *Regulatory Provisions of the Commerce Act 1986, Discussion Paper*, 19 December 2008, Chapter 3.

¹¹ Commerce Commission, *Part IV Inquiry into Airfield Activities at Auckland, Wellington and Christchurch International Airports, Final Report*, 1 August 2002.

¹² Commerce Commission, *Gas Control Inquiry, Final Report*, 29 November 2004.

¹³ Commerce Act (Powerco Natural Gas Services) Authorisation 2008, Commission Decision No. 656; and Commerce Act (Vector Natural Gas Services) Authorisation 2008, Commission Decision No. 657.

Transpower, administered by the Commission. The targeted control regime was intended to be less costly than implementing full price control for all EDBs, given there were 28 EDBs at the time (now 29) for a small economy.¹⁴

- 1.2.15 The regime was ‘targeted’ as only ELBs breaching the CPI-X price path or quality thresholds set by the Commission were potentially subject to a ‘post-breach’ inquiry and possible control under the old Part 5. The Commission did not impose control on any ELBs that had breached the thresholds, but it did, however, enter into ‘administrative settlements’ with three of those ELBs, namely Vector, Unison and Transpower.

Commerce Amendment Act 2008

- 1.2.16 The Explanatory Note to the Commerce Amendment Bill 2008 (Explanatory Note to the Bill) set out the reasons why the Government considered that economic regulation was required.

The key reason for providing for price and quality control, or “economic regulation”, is to counter the ability of firms that are not faced with competition or the threat of competition to charge excessive prices and/or reduce quality. Such firms may also have weak incentives to improve efficiency and to make investments in a timely manner.

In practice, there are relatively few sectors that are not faced with competition or the threat of competition. These sectors tend to be those supplying core infrastructure such as electricity lines, gas pipelines, and airports. All OECD countries regulate such sectors, particularly where they are privately owned.¹⁵

- 1.2.17 There were a number of reasons why the provisions for economic regulation in the Act were amended in 2008. The Explanatory Note set out the key issues raised during the review of the regulatory provisions of the Act, and explained the amendments made to address those issues. The key issues and amendments include the following:

- *Purpose statement.* The lack of a purpose statement specific to old Part 4 inquiries led to “dispute and uncertainty”, including judicial review. Under Part 4, a new common purpose statement was introduced for all regulatory provisions, building on the purpose statement in the old Part 4A, but with the addition of a specific requirement for regulation to incentivise investment and innovation.¹⁶ The purpose statement of Part 4 (Part 4 Purpose) is discussed further below (Sections 2.3-2.6).
- *Types of regulation.* Prior to the amendment, the only type of regulation contemplated by Part 4 was price-quality control. The new Part 4 introduced a broader range of “fit-for-purpose” types of regulation: information disclosure regulation (subpart 4 of Part 4); default/customised price-quality regulation (subpart 6); individual price-quality regulation (subpart 7); and negotiate-arbitrate regulation (subpart 5).¹⁷ Information disclosure regulation under

¹⁴ For instance, this compares to Great Britain where there are only 14 electricity distribution network service operators.

¹⁵ The Explanatory Note to the Commerce Amendment Bill (201-1), Government Bill, as introduced to the House of Representatives, Wellington, 13 February 2008 (Explanatory Note), p. 2.

¹⁶ *ibid*, pp. 3 and 15-20.

¹⁷ *ibid*, pp. 3, 5-6, 15, 18 and 21-22.

Part 4 is discussed further below (paragraphs 2.7.11-2.7.14), as is default/customised price-quality regulation (paragraphs 2.7.1-2.7.10).

- *Regulatory certainty.* The Commission was perceived as having significant discretion under Part 4A and Part 5 in respect of setting thresholds, undertaking post-breach inquiries, and implementing control or administrative settlements. Many interested parties argued that this led to uncertainty for regulated, or potentially regulated, suppliers. Under the new Part 4 the Commission must set up-front regulatory methodologies, rules, processes, requirements and evaluation criteria—i.e. ‘input methodologies’—applicable to particular regulated services and types of regulation.¹⁸ The IMs that the Commission has set for regulated services supplied by EDBs and GPBs are the focus of this Paper. The IMs that the Commission has set for regulated services supplied by Transpower and by the three main international airports are discussed in separate papers.¹⁹
- *Accountability of the Commission.* Some interested parties argued that the old Parts 4, 4A and 5 provided only limited accountability for decisions made by the Commission. Most decisions were subject only to judicial review, and not to an appeal against the substance of a decision.²⁰ Under the new Part 4, interested parties may appeal to the High Court against the Commission’s IM determinations, and determinations concerning customised price-quality paths, on the merits. The Act provides that an appeal may be allowed if the Court concludes that an amended or substituted IM would be “materially better” in meeting the Part 4 Purpose in s 52A, the purpose of IMs in s 52R, or both (s 52Z(4)).²¹

1.2.18 Other notable amendments included:

- for EDBs, all EDBs remained subject to information disclosure regulation, and the targeted control regime was replaced by default/customised price-quality regulation; however, EDBs meeting the definition ‘consumer-owned’ under s 54D are exempt from default/customised price-quality regulation;²²
- for Transpower, the targeted control regime was replaced by individual price-quality regulation;²³

¹⁸ *ibid*, pp. 3, 18 and 25-27.

¹⁹ Commerce Commission, *Input Methodologies (Transpower) Reasons Paper*, 22 December 2010; Commerce Commission, *Input Methodologies (Airport Services) Reasons Paper*, 22 December 2010. The Airports Reasons Paper notes that a specific concern for that sector was the effectiveness of the information disclosure regime for airports.

²⁰ Explanatory Note, *supra* n 16, pp. 3 and 17-18.

²¹ *ibid*, pp. 7 and 27-31.

²² *ibid*, pp. 8, 15, 22-24 and 31-32.

²³ Section 54M(3) requires that, before Transpower’s administrative settlement expires (30 June 2011), the Commission must recommend to the Minister of Commerce that an Order in Council be made under s 52N declaring that Transpower be subject to either default/customised price-quality regulation, or individual price-quality regulation. Following consultation with interested parties, in April 2010 the Commission recommended to the Minister that individual price-quality regulation apply to Transpower. The Order-in-Council declaring that Transpower is subject to individual price-quality regulation was made on 23 August 2010 and commenced on 1 October 2010. Transpower will be subject to individual price-quality regulation from 1 April 2011.

- for GPBs, the responsibility for information disclosure was transferred from MED to the Commission, and price-quality regulation extended to more GPBs than those already under the Gas Authorisation;²⁴ and
- transitional provisions that maintain a number of pre-existing regulatory provisions in force, notably: the existing information disclosure regimes for ELBs and GPBs (until such time as the Commission makes applicable information disclosure determinations under Part 4); the administrative settlement for Transpower (until 30 June 2011); and the Gas Authorisation for Powerco and Vector (until 30 June 2012).

1.2.19 The Explanatory Note to the Bill describes the Bill’s objectives as being to:

- provide an efficient and credible regime to address the potential to exercise market power in markets where competition is not possible:
- improve clarity, certainty, timeliness, and predictability for businesses:
- tailor the regime to New Zealand’s small size (with small firms and limited resources):
- provide specifically for incentives to invest in infrastructure. Certainty is considered a pre-requisite for this.²⁵

1.2.20 Although intended to put in place a “regulatory regime in line with the OECD mainstream to allow for regulation of suppliers of core infrastructural services, which are not subject to competition”,²⁶ a number of key features of Part 4 are either unique or not widespread, notably:

- a purpose statement that includes an explicit reference to “promoting outcomes that are consistent with outcomes produced in [workably] competitive markets”;²⁷
- the setting of IMs—for instance, in Australia the Australian Energy Market Commission (AEMC) sets regulatory rules to be applied by the Australian Energy Regulator (AER), whereas in the UK, the Office of the Gas and Electricity Markets (Ofgem) is not bound by regulatory rules set in advance;
- *default* price-quality paths (DPPs) backed up by customised price-quality paths (CPPs), which appear to be unique to New Zealand; and

²⁴ Explanatory Note, supra n 16, p. 8.

²⁵ *ibid*, pp. 3-4.

²⁶ *ibid*, p. 9.

²⁷ The previous Australian National Electricity Rules were an exception. One of a number of core objectives was to: “regulate the non competitive market for distribution services in a way which seeks the same outcomes as those achieved in competitive markets” (Australian Energy Market Commission (AEMC), National Electricity Rules, Version 14, 31 May 2007, s 6.1.1(b)). However, the rules have since been amended by removing the core objectives, and references are now to the “national electricity objective” which is defined in the National Electricity Law. The national electricity objective is: “to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to—(a) price, quality, safety, reliability and security of supply of electricity; and (b) the reliability, safety and security of the national electricity system” (section 7 of the National Electricity Law, which is a schedule to the National Electricity (South Australia) Act 1996).

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- the “materially better” standard of appeal.
- 1.2.21 The determination of IMs for EDBs and GPBs marks a significant milestone in the implementation of the new Part 4 regime. This implementation will continue throughout 2011 and 2012 with the consultation on starting price adjustments for the current DPP for EDBs under s 54K(3), as well as setting of:
- information disclosure requirements for EDBs and GPBs that are consistent with Part 4 and the relevant IMs; and
 - the first DPP for GPBs.
- 1.2.22 As a result of this ongoing consultation and implementation, the Commission anticipates that some relatively minor consequential amendments to the IMs may be required to align the IMs with the regulatory instruments. Examples are discussed throughout this Paper and include:
- the approach to determining quality standards for GPBs under CPPs; and
 - the categories of expenditure that EDBs and GPBs must use in submitting a CPP proposal, which the Commission considers should align with information disclosure.
- 1.2.23 Such amendments should improve the effectiveness of the overall regulatory regime. The Commission will consult on any amendments in accordance with ss 52V and 52X.

1.3 Structure of this Paper

- 1.3.1 The IMs are complex and, in some cases, the methodology comprises many detailed components that determine how the IMs apply to the regulatory instruments in practice. The detailed components for each IM depend to a large extent on the type of IM and the overall approach for that IM. To assist the reader, the Commission has therefore structured this Paper into two main parts as described below.

Part 1: Regulatory framework and key features of the IMs

- In this part, the Commission:
 - describes the Part 4 regulatory framework, including the role of IMs in that framework;
 - provides an overview of, and the Commission’s reasons for, the key features of each of the IMs; and
 - briefly discusses the application of each IM to the types of regulation relevant to EDBs and GPBs under Part 4 (i.e. information disclosure and default/customised price-quality regulation).
- Each IM (or group of IMs) is discussed in a separate chapter.

Part 2: Appendices on the detailed components of the IMs and how they apply

- Part 2 provides more detailed technical discussion on the components of the IMs and how each IM is applied to information disclosure and default/customised price-quality regulation. There is at least one Appendix of this nature for each IM.
- In this part, the Commission also provides more detail on the consultation process it has undertaken to determine IMs (Appendix A); and the regulatory provisions for asset valuation prior to the CAA being enacted (Appendix F).

Response to submissions

- 1.3.2 Submissions received during the consultation process are discussed in both parts of this Paper. The Commission's views on the appropriate IMs have evolved during the consultation process, and it has responded to submissions from consultation rounds prior to the consultation on the draft IM Determinations (Draft IMs) in its earlier papers (discussed further in Section 1.4 below). This Paper, therefore, primarily responds to submissions and cross-submissions received on the Draft IMs.²⁸
- 1.3.3 Where submissions on the Draft IMs were addressed by changes to the Draft Determinations for the purpose of technical consultation, they are not discussed again in this Paper.²⁹

1.4 Process to Determine IMs

Statutory process for determining IMs

- 1.4.1 The statutory process for determining IMs is contained in s 52V, which provides that:
- (1) When the Commission begins work on an input methodology, it must publish a notice of intention to do so that –
 - (a) outlines the process that will be followed; and
 - (b) sets out the proposed time frames.
 - (2) During the course of its work on an input methodology, the Commission –
 - (a) must publish a draft methodology; and
 - (b) must give interested persons a reasonable opportunity to give their views on that draft methodology; and
 - (c) may hold 1 or more conferences; and

²⁸ In making the IM Determinations for EDBs and GPBs, the Commission has also considered other relevant submissions on IMs, including those from interested parties submitting in respect of the IM Determinations for airports and Transpower.

²⁹ The reasons for changes to the draft determination were explained in Consultation Update Papers released with the Revised Draft Determinations for technical consultation. Commerce Commission, *Input Methodologies (Electricity Distribution Services) Consultation Update Paper*, 22 October 2010; Commerce Commission, *Input Methodologies (Gas Pipeline Services) Consultation Update Paper*, 1 November 2010.

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- (d) must have regard to any views received from interested persons within any time frames set.
- (3) Despite subsections (1) and (2), any work done or action taken (including any consultation) by the Commission on input methodologies before the commencement of this section may be treated by the Commission and any person consulted as work done or action taken under this section.
- (4) The Commission must consult with interested parties before deciding to treat earlier work or action as work or action done under this section.

Commission's process for determining IMs

1.4.2 In accordance with s 52V(1), on 11 December 2008 the Commission published a notice of intention (Intention Notice) advising that it had begun work on IMs.³⁰ Since December 2008, the Commission has undertaken extensive consultation with interested parties. The interested parties on IMs for EDBs and GPBs have primarily been the regulated suppliers. This contrasts with the consultation process on IMs for airport services, where airlines (the Board of Airline Representatives of New Zealand (BARNZ) and Air New Zealand) provided a consumer perspective on all matters throughout. Given that the views of suppliers dominated submissions made during consultation on IMs for EDBs and GPBs, the Commission has found it particularly helpful to obtain independent expert advice on some topics.³¹ This expert advice is discussed further below.

1.4.3 The consultation process can be described in three broad phases:

- Phase I: Discussion (December 2008 to November 2009).
- Phase II: Draft Determinations (December 2009 to September 2010).
- Phase III: Determinations (October 2010 to December 2010).

1.4.4 A brief summary of the Commission's process is below. More detail on the papers released at each consultation step is set out in Appendix A.

Extension to the deadline for determining IMs

1.4.5 During the Discussion phase, a number of interested parties raised concerns about timeframes for consultation, and the need for engagement on the detailed implementation of IMs. In particular, a number of parties sought to engage with the Commission through workshops on detailed proposals for IMs specific to each type of regulated service.

1.4.6 In response to these concerns, the Commission sought an extension to the deadline for determining IMs for services regulated under subparts 9 to 11 of Part 4. On 10 December 2009, the Minister of Commerce (Minister) announced his decision to

³⁰ Further detail on the process for IMs was set out in the Commission's discussion paper on the new legislative provisions: Commerce Commission, *Regulatory provisions of the Commerce Act 1986 – Discussion paper*, 19 December 2008 (Provisions Paper). Throughout the process to determine IMs, the Commission kept interested parties up to date on the process and timing of consultation steps through media releases, updates on its website and email notifications.

³¹ As noted above, the Commission has, however, been able to take into account the views of BARNZ and other interested parties from consultation on IMs for airports, to the extent that they have been relevant to EDBs and GPBs.

grant the Commission an extension under s 52U(2) of 6 months, to 31 December 2010. The extension allowed the Commission to undertake additional consultation during Phase II.

Phase I – Discussion

1.4.7 A discussion paper on the new legislative provisions (the Provisions Paper), including IMs, was released in December 2008.³² The Commission consulted on its preliminary views for IMs and how they would be applied for each of the regulated services under subparts 9-11 of Part 4 through its Input Methodologies Discussion Paper and associated reports (released in June 2009);³³ a public conference on IMs (other than the IM for the cost of capital); and a separate workshop on the cost of capital in November 2009. Written submissions and cross-submissions from interested parties were received at each stage.

Phase II – Draft Determinations

1.4.8 The key consultation step in the process to determine IMs was the publication of the Draft IMs for each type of regulated service in accordance with s 52V(2)(a) (the Draft IMs). The Draft IMs for EDBs and GPBs were released in July 2010.³⁴ Prior to the release of the Draft IMs, the Commission updated interested parties on its preliminary views through the release of Emerging Views Papers in December 2009³⁵ and held a series of workshops with interested parties during February and March 2010. Written submissions and cross-submissions from interested parties were sought at each stage, including before and after each workshop.

Phase III – Determinations

1.4.9 In Phase III, the Commission released Revised Draft Determinations for consultation on the technical drafting of the determinations.³⁶ Written submissions were sought to ensure that the drafting of the IM Determinations properly gave effect to the intended approaches for the IMs.

Expert advice obtained by the Commission

1.4.10 The Commission has been assisted throughout the process to determine IMs by expert advice. An overview of the expert advice obtained by the Commission is provided below. The Commission has had regard to this advice in determining IMs.

³² Commerce Commission, Provisions Paper, supra n 30.

³³ Commerce Commission, *Input Methodologies Discussion Paper*, 19 June 2009.

³⁴ Commerce Commission, *Draft Commerce Act (Electricity Distribution Services Input Methodologies) Determination*, 2 July 2010; Commerce Commission, *Draft Commerce Act (Gas Transmission Services Input Methodologies) Determination*, 2 July 2010; Commerce Commission, *Draft Commerce Act (Gas Distribution Services Input Methodologies) Determination*, 2 July 2010. The Draft Reasons Papers setting out the Commission's draft decisions for IMs were released in June 2010. Commerce Commission, *Input Methodologies (Electricity Distribution Services) Draft Reasons Paper*, 18 June 2010; Commerce Commission, *Input Methodologies (Gas Pipeline Services) Draft Reasons Paper*, 21 June 2010.

³⁵ Commerce Commission, *Input Methodologies (Electricity Distribution Services) Emerging Views Paper*, 23 December 2009. Commerce Commission, *Input Methodologies (Gas Pipeline Services) Emerging Views Paper*, 23 December 2009. An Emerging Views Paper for Transpower was not released at this stage as Transpower was not discussed at the September 2009 input methodologies conference. A workshop on matters relating to the regulation of Transpower was instead held in March 2010.

³⁶ Commerce Commission, *Revised Draft Commerce Act (Electricity Distribution Services Input Methodologies) Determination*, 22 October 2010; Commerce Commission, *Revised Draft Commerce Act (Gas Transmission Services Input Methodologies) Determination*, 1 November 2010; Commerce Commission, *Revised Draft Commerce Act (Gas Distribution Services Input Methodologies) Determination*, 1 November 2010.

Economic advisors

1.4.11 The Commission's independent expert economic advisors for IMs (Experts) were:

- Professor Martin Cave of the London School of Economics; the Centre on Regulation in Europe; and Cambridge Economic Policy Associates;
- Dr Michael Pollitt of Cambridge University;
- Dr John Small of Covec Limited; and
- Professor George Yarrow of the Regulatory Policy Institute, Oxford.

1.4.12 Three of the Experts (Professors Cave and Yarrow and Dr Small) attended the Commission's conference on IMs in September 2009 to hear the views of interested parties and provide comment during the proceedings. Dr Small also attended the workshop for EDBs and GPBs on 24 February 2010.

1.4.13 The Experts prepared a joint report on asset valuation in workably competitive markets (Asset Valuation Report), which was released for consultation with the Draft IMs.³⁷ Submissions from interested parties on the Asset Valuation Report were reviewed by the Experts (the Submissions Review).³⁸

1.4.14 Each Expert was asked to undertake an individual independent expert review of the Commission's draft decisions for IMs as set out in the Draft Reasons Papers for EDBs and GPBs³⁹ (the Draft Expert Reviews). The Draft Expert Reviews were released for comment during the consultation period.⁴⁰ In addition, each Expert was also provided with an opportunity to respond to comments on his individual report in the Submissions Review.⁴¹

1.4.15 Professor Yarrow and Dr Small were also requested to respond to comments in a memorandum from Competition Economics Group (CEG) on behalf of Vector.⁴² The memorandum commented on reports prepared by each Expert on behalf of Telstra, which were submitted to the Australian Competition and Consumer Commission (ACCC).⁴³

³⁷ Yarrow, G., Cave, M., Pollitt, M., Small, J., *Asset Valuation in Workably Competitive Markets - A Report to the New Zealand Commerce Commission*, May 2010 (Asset Valuation Report).

³⁸ Yarrow, G., Cave, M., Pollitt, M., Small, J., *Review of Submissions on Asset Valuation in Workably Competitive Markets - A Report to the New Zealand Commerce Commission*, November 2010 (Submissions Review).

³⁹ Commerce Commission, *Input Methodologies (Electricity Distribution Services) Draft Reasons Paper*, 18 June 2010; Commerce Commission, *Input Methodologies (Gas Pipeline Services) Draft Reasons Paper*, 21 June 2010.

⁴⁰ Cave, M., *Expert Review of the New Zealand Commerce Commission's Draft Decisions and Reasons for Electricity Distribution Services and Gas Pipeline Services*, July 2010; Pollitt, M., *Expert Review of the New Zealand Commerce Commission's Draft Decisions and Reasons for Electricity Distribution Services and Gas Pipeline Services*, July 2010; Small, J., *Expert Review of the New Zealand Commerce Commission's Draft Decisions and Reasons for Electricity Distribution Services and Gas Pipeline Services*, July 2010; Yarrow, G., *Review of Input Methodologies (Electricity Distribution Services and Gas Pipeline Services) Draft Reasons Paper*, July 2010.

⁴¹ supra n 38.

⁴² Competition Economics Group (on behalf of Vector), *Expert reports of Dr Small and Professor Yarrow*, 17 November 2010.

⁴³ Small, J., *Response to CEG*, 23 November 2010; Yarrow, G., *Comments on a CEG memorandum of 17 November 2010*, 14 December 2010.

- 1.4.16 The Commission also asked the Experts to undertake similar independent reviews of its updated decisions prior to the Commission determining the IMs (Final Expert Reviews). These decisions were updated following the Commission's consideration of submissions on the Draft IMs from interested parties.⁴⁴
- 1.4.17 The Submissions Review, responses from Professor Yarrow and Dr Small to CEG's comments and the Final Expert Reviews from Professors Cave and Yarrow and Dr Small were published on the Commission's website on 16 December 2010. The Final Expert Review from Dr Pollitt was published on the Commission's website on 22 December 2010.

The cost of capital

- 1.4.18 Prior to the CAA being passed, the Commission had engaged a Cost of Capital Expert Panel (Expert Panel) to advise it in developing its generic Cost of Capital Guidelines to apply across all services it regulates. The Expert Panel has continued to advise the Commission in relation to the cost of capital for IMs (paragraphs 1.4.19 - 1.4.23).
- 1.4.19 The Expert Panel is comprised of:
- Professor Julian Franks of London Business School;
 - Dr Martin Lally of Victoria University of Wellington; and
 - Professor Stewart C. Myers of the MIT Sloan School of Management.
- 1.4.20 The Expert Panel's report was released for consultation as part of the Discussion phase (with the IM Discussion Paper and Revised Draft Cost of Capital Guidelines).⁴⁵
- 1.4.21 Dr Lally attended the Commission's Cost of Capital Workshop in November 2009 to hear the views of interested parties and provide comment during the proceedings.
- 1.4.22 Subsequent to the Cost of Capital Workshop, the Commission engaged the Expert Panel to provide independent advice on whether it should change its previous estimate of the tax-adjusted market risk premium (TAMRP) as a result of the recent global financial crisis (GFC).⁴⁶
- 1.4.23 The Expert Panel's joint report on the TAMRP was released for consultation with the Draft Reasons Papers for IMs.

⁴⁴ Cave, M., *Expert Review of Reasons Papers of the New Zealand Commerce Commission relating to Electricity Distribution and Gas Pipeline Services and to Airports*, 13 December 2010; Pollitt, M., *Expert Review of the New Zealand Commerce Commission's Input Methodologies (Airport Services) Reasons Paper and Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper*, December 2010; Small, J., *Expert Review of Input Methodology Reasons Papers*, 14 December 2010; Yarrow, G., *Review of Input Methodologies (Electricity Distribution Services, Gas Pipeline Services and Airports) Reasons Papers*, 14 December 2010.

⁴⁵ Franks, J., Lally M., & Myers S., *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, 18 December 2008.

⁴⁶ Franks, J., Lally, M., Myers, S., *Recommendation to the New Zealand Commerce Commission on whether or not it should change its previous estimate of the tax-adjusted market risk premium as a result of the recent global financial crisis*, 14 April 2010.

1.4.24 Dr Lally has also reviewed certain submissions from PricewaterhouseCoopers (PwC) and Professor Guthrie on the Commission's draft decisions for the cost of capital IMs. These reports are:

- Comments on Input Methodologies (EDS) Draft Reasons Paper;⁴⁷ and
- Comments on Measurement Error and Regulated Firms' Allowed Rates of Return.⁴⁸

1.4.25 Dr Lally's reports were published on the Commission's website on 16 December 2010.

Advice on operating and capital expenditure requirements

1.4.26 The Commission engaged Farrier Swier Consulting Limited (Farrier Swier) and Strata Energy Consulting Limited (Strata) to assist it in determining the appropriate approach to assessing forecast expenditure under a CPP and the information requirements necessary to support that assessment.

1.4.27 In light of advice from Farrier Swier,⁴⁹ the Commission provided Strata with working assumptions to develop CPP opex/capex/demand information requirements, with separate requirements for EDBs, GDBs and GTBs. The Commission has held several rounds of consultation on Strata's draft requirements, including workshops in March and April 2010 and the release of Strata's recommendations with the Draft IMs.⁵⁰ The Commission asked Strata to review submissions and cross-submissions relevant to its recommendations (the Strata Submissions Review).⁵¹ The Strata Submissions Review was released on 22 October 2010 as part of the technical consultation round.

⁴⁷ Lally, M., *Comments on Input Methodologies (EDS) Draft Reasons Paper*, 3 September 2010.

⁴⁸ Lally, M., *Comments on Measurement Error and Regulated Firms' Allowed Rates of Return*, 13 September 2010.

⁴⁹ Farrier Swier, *Assessing expenditure in a Customised Price-Quality Path review: Electricity distribution, gas distribution and gas transmission*, 3 June 2009. The Commission consulted on this report along with its Input Methodologies Discussion Paper in June 2009.

⁵⁰ Strata Energy Consulting, *Specifying the CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand (draft), For the Commerce Commission*, June 2010 (Overview Report); Strata Energy Consulting, *Draft qualitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand, Electricity Distribution, For the Commerce Commission*, June 2010; Strata Energy Consulting, *Draft qualitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand, Gas Distribution, For the Commerce Commission*, June 2010; Strata Energy Consulting, *Draft qualitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand, Gas Transmission, For the Commerce Commission*, June 2010 (Qualitative CPP Requirements); Strata Energy Consulting, *Draft quantitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand, Electricity Distribution, For the Commerce Commission*, June 2010; Strata Energy Consulting, *Draft quantitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand, Gas Distribution, For the Commerce Commission*, June 2010; Strata Energy Consulting, *Draft quantitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand, Gas Transmission, For the Commerce Commission*, June 2010 (Quantitative CPP Requirements).

⁵¹ Strata Energy Consulting, *Input Methodologies – Review of submissions on CPP information requirements for capex, opex and demand – For the Commerce Commission*, 18 October 2010.

CHAPTER 2: PART 4 REGULATORY FRAMEWORK

2.1 Introduction

2.1.1 This chapter discusses the regulatory framework under Part 4 of the Act and, in particular, the role of IMs within the context of that framework.

2.1.2 This chapter is structured as follows:

- Sections 2.2 and 2.3 provide an introductory overview of IMs, as well as of the purpose of information disclosure regulation and default/customised price-quality regulation;
- Section 2.4 discusses the Part 4 Purpose;
- Section 2.5 provides an overview of how the concept of ‘workable or effective competition’—the concept of competition that underpins all parts of the Act, including Part 4—has been described, in both economics and in relevant case law;
- Section 2.6 discusses outcomes consistent with those produced in workably competitive markets in the context of the Part 4 Purpose;
- Section 2.7 explains the role of default/customised price-quality regulation and information disclosure regulation in promoting the Part 4 Purpose;
- Section 2.8 explains the relationship of IMs to default/customised price-quality regulation and information disclosure regulation; and
- Section 2.9 sets out a number of additional statutory considerations relevant to setting IMs for EDBs and GPBs.

2.1.3 The regulatory framework is applied in the analysis underpinning the IMs set out in the following chapters.

2.2 Introduction to IMs under Part 4

Types of regulation, types of regulated services, and IMs

2.2.1 Section 52B of the Act explains that Part 4 provides for a number of different types of regulation, including information disclosure regulation and default/customised price-quality regulation. Electricity lines services and gas pipeline services are regulated under Part 4 (ss 54E and 55B) and defined under the Act (ss 54C and 55A).⁵² Subpart 9 of Part 4 sets out provisions specific to the regulation of electricity lines services and subpart 10 sets out provisions specific to gas pipeline services. The Commission is required to make determinations under s 52P that

⁵² Powerco has requested that in the IM the Commission define regulated services more precisely than what is given in the Act (Powerco Submission 1 in response to draft input methodology and information disclosure determinations; 9 August 2010; p. 19). The Commission considers that if any greater prescription is required, then that should be dealt with in the context of the type of regulation applying to that service – i.e. price-quality and/or information disclosure regulation, rather than in IMs.

specify how information disclosure regulation and default/customised price-quality regulation apply to the suppliers of electricity lines services and gas pipeline services (ss 54F, 54G, 55C and 55D).⁵³

- 2.2.2 Section 52P determinations are, in turn, underpinned by a series of IMs that set out the rules, requirements and processes applying to the regulation of those services. As noted in Chapter 1, this Paper only discusses the IM Determinations that have been made by the Commission in respect of electricity distribution services, gas distribution services and gas transmission services. The IM Determinations made by the Commission in respect of regulated services supplied by Transpower and airports are discussed in separate papers.
- 2.2.3 Section 52T provides the Commission with a broad discretion as to the content and structure of IMs. In exercising its discretion, the Commission has had regard to a number of relevant considerations, including the purpose of IMs as set out in s 52R, the purpose of information disclosure regulation and default/customised price-quality regulation (as applicable), the Part 4 Purpose in s 52A, and all submissions made by interested parties throughout the consultation process.⁵⁴

Purpose of IMs

- 2.2.4 Subpart 3 and s 52C of Part 4 of the Act set out what IMs are, how they are determined and how they apply. Section 52R provides that the purpose of IMs is:

to promote certainty for suppliers and consumers in relation to the rules, requirements, and processes applying to the regulation, or proposed regulation, of goods or services under [Part 4].

- 2.2.5 Promoting certainty is an important contributor to fostering an environment in which regulated suppliers have the appropriate incentives to invest, innovate and improve efficiency. The Commission considers that IMs will promote certainty by setting out, as clearly as possible, a number of the key ‘inputs’, whether direct or indirect, to information disclosure regulation and default/customised price-quality regulation. As CRA International (CRA) submitted (on behalf of Unison), promoting certainty primarily requires that IMs are “well-specified to prevent, as far as possible, differences in interpretation by suppliers and regulators”. Certainty, however, does not necessarily dictate what the most appropriate methodology is. The Commission generally agrees with CRA that promoting certainty” has no direct implication for the choice of alternatives within each methodology”.⁵⁵

⁵³ Some EDBs are exempt under s 54G(2) from default price-quality regulation because those EDBs meet the definition of being ‘consumer-owned’ as defined in s 54D (‘consumer-owned EDBs’).

⁵⁴ As noted above, in making the IM Determinations for EDBs and GPBs, the Commission has also considered other relevant submissions on IMs, including those from interested parties submitting in respect of the IM Determinations for airports and Transpower.

⁵⁵ CRA International, *Regulatory Provisions of the Commerce Act, Final Report prepared for Unison Networks*, 16 February 2009, p. 28.

2.2.6 In addition, the need to promote certainty does not dictate what the final numeric result will be in all cases, when applying an IM. That may depend on future data or circumstances, at the time the IM is applied.⁵⁶

Definition of IMs

2.2.7 'Input methodology' is defined broadly in s 52C as:

a description of any methodology, process, rule, or matter that includes any of the matters listed in section 52T and that is published by the Commission under section 52W; and, in relation to particular goods or services, means any input methodology, or all input methodologies, that relate to the supply, or to suppliers, of those goods or services.

2.2.8 This definition is elaborated on in s 52T:

- (1) The input methodologies relating to particular goods or services must include, to the extent applicable to the type of regulation under consideration, –
 - (a) methodologies for evaluating or determining the following matters in respect of the supply of the goods or services:
 - (i) cost of capital;
 - (ii) valuation of assets, including depreciation, and treatment of revaluations;
 - (iii) allocation of common costs, including between activities, businesses, consumer classes, and geographic areas;
 - (iv) treatment of taxation; and
 - (b) pricing methodologies, except where another industry regulator (such as the Electricity Authority) has the power to set pricing methodologies in relation to particular goods or services; and
 - (c) regulatory processes and rules, such as –
 - (i) the specification and definition of prices, including identifying any costs that can be passed through to prices (which may not include the legal costs of any appeals against input methodology determinations under this Part or of any appeals under section 91 or section 97); and
 - (ii) identifying circumstances in which price-quality paths may be reconsidered within a regulatory period; and
 - (d) matters relating to proposals by a regulated supplier for a customised price-quality path, including –
 - (i) requirements that must be met by the regulated supplier, including the scope and specificity of information required, the extent of independent verification and audit, and the extent of consultation and agreement with consumers; and

⁵⁶ For example, in the context of the cost of capital IM, the IM sets out a process for the Commission to update and publish the cost of capital each year to ensure it is current. Doing so provides the degree of certainty that is warranted because when suppliers of regulated services come to use the WACC for a CPP proposal, they should know what it will be at least six months before they make the proposal.

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- (ii) the criteria that the Commission will use to evaluate any proposal.
- (2) Every input methodology must, as far as is reasonably practicable, –
- (a) set out the matters listed in subsection (1) in sufficient detail so that each affected supplier is reasonably able to estimate the material effects of the methodology on the supplier; and
 - (b) set out how the Commission intends to apply the input methodology to particular types of goods or services; and
 - (c) be consistent with the other input methodologies that relate to the same type of goods or services.
- (3) Any methodologies referred to in subsection (1)(a)(iii) must not unduly deter investment by a supplier of regulated goods or services in the provision of other goods or services.

How IMs apply

2.2.9 Section 52C provides that IMs relate to ‘the supply, or to suppliers, of [particular] goods or services’. Section 52T(1) provides that IMs must include certain matters ‘to the extent applicable to the type of regulation’. The IMs that apply to a particular type of regulated service, and which are therefore relevant to the regulated suppliers that supply those types of services, will therefore also depend on the type or types of regulation to which the services are subject.

2.2.10 The provisions in the Act relating to default/customised price-quality regulation include provisions that are specific to default price-quality paths (s 53O to s 53P) and customised price-quality paths (s 53Q to s 53ZA) respectively. In addition, the IMs referred to in s 52T(1)(d) only relate to customised price-quality paths. Therefore, and in accordance with section 52T(2)(b), in the IM Determinations for electricity distribution services, gas distribution services and gas transmission services, the Commission has specified how the relevant IMs apply in respect of three different ‘regulatory instruments’:

- information disclosure;
- DPPs; and
- CPPs.

2.3 Purpose of Regulatory Instruments

Purpose of information disclosure regulation

2.3.1 Section 53A of the Act provides that the purpose of information disclosure regulation is:

to ensure that sufficient information is readily available to interested persons to assess whether the purpose of [Part 4] is being met.

2.3.2 The way in which input methodologies relate to information disclosure regulation is discussed in Section 2.8 of this chapter.

Purpose of default/customised price-quality regulation

2.3.3 Section 53K of the Act provides that the purpose of default/customised price-quality regulation is:

to provide a relatively low-cost way of setting price-quality paths for suppliers of regulated goods or services, while allowing the opportunity for individual regulated suppliers to have alternative price-quality paths that better meet their particular circumstances.

2.3.4 The way in which input methodologies relate to default/customised price-quality regulation is discussed in Section 2.8 of this chapter.

2.4 Purpose of Part 4

2.4.1 Section 52A of the Act states that the purpose of Part 4 is:

to promote the long-term benefit of consumers in markets referred to in section 52 by promoting outcomes that are consistent with outcomes produced in competitive markets such that suppliers of regulated goods or services—

- (a) have incentives to innovate and to invest, including in replacement, upgraded, and new assets; and
- (b) have incentives to improve efficiency and provide services at a quality that reflects consumer demands; and
- (c) share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices; and
- (d) are limited in their ability to extract excessive profits.

2.4.2 The central purpose, therefore, is to promote the long-term benefit of consumers in markets where there is little or no competition and little or no likelihood of a substantial increase in competition. ‘Competition’ in the context of Part 4 of the Act means ‘workable or effective competition’ (s 3(1) of the Act).⁵⁷

2.4.3 This central purpose is to be achieved by promoting outcomes consistent with those produced in workably competitive markets. The Commission has therefore sought to identify the outcomes typically produced in workably competitive markets. The IMs are designed to promote, in the regulated markets, outcomes consistent with those in workably competitive markets such that the objectives set out in s 52A(1)(a)-(d) of the Act are achieved.

2.4.4 Interested parties from the electricity and gas sectors, as well as the airport sector, have varied in how they referred to paragraphs (a) to (d)—‘outcomes’, ‘characteristics’, and ‘objectives’ have been some of the terms used during the consultation process. The Commission has adopted the terminology of both the Explanatory Note to the Commerce Amendment Bill and the Select Committee Report on the Bill, namely that paragraphs (a) to (d) set out the ‘objectives’ to be

⁵⁷ Except where references specifically refer to ‘effective competition’, ‘workable competition’ is used hereafter to refer to both workable and effective competition, and ‘workably competitive markets’ to refer to workably or effectively competitive markets.

achieved by Part 4 regulation.⁵⁸ As clarified in the Explanatory Note to the Commerce Amendment Bill, promoting the long-term interests of consumers by promoting outcomes consistent with workable competition “requires suppliers to have incentives to invest and innovate, have incentives to improve efficiency and provide services at a quality required by consumers, share the benefits of efficiency gains with consumers, and limit excessive profits”.⁵⁹ These ‘requirements’, or regulatory objectives, are reflected in paragraphs (a) to (d) of s 52A(1) of the Act.

2.4.5 Both CIAL and Powerco cautioned the Commission against using the term “regulatory objectives”, and refers to (a) to (d) as “sub-paragraphs”. It considered that “there is a risk that the Commission is seen to be that elevating (a) to (d) to be the primary means of promoting the central purpose of Part 4 - which is clearly incorrect”.⁶⁰ The concern of submitters in general appears to be the relevance of (a) to (d) in setting IMs. For instance, Orion has argued that “if the workably competitive standard is used as the Commission’s starting point, each of the section 52A(1)(a)-(d) criteria flows as a matter of course”.⁶¹ ENA submitted that: “outcomes consistent with workable competition are taken to have occurred if the outcomes identified in s 52A(1)(a) to (d) are observed. By contrast, if the outcomes in paragraphs (a) to (d) are not observed or cannot be obtained, the outcome may not be consistent with workable competition”.⁶²

2.4.6 The Commission’s view is that the objectives in paragraphs (a) to (d) are integral to promoting the long-term benefit of consumers, and reflect the key areas of supplier performance that characterise workable competition (paragraphs 2.6.27-2.6.28). Unison submitted that “in order to determine whether the central purpose (long-term benefit of consumers) is to be fulfilled, one has to inquire whether outcomes consistent with outcomes produced in workably competitive markets are being promoted such that section 52A(1)(a) to (d) requirements are met”.⁶³ The Commission agrees. This is in fact how the Commission has interpreted and applied the purpose of Part 4.

⁵⁸ The Explanatory Note (supra n 16) refers to (a) to (d) as objectives when setting out the rationale that informed the Part 4 Purpose. References include the one at page 4, under the heading ‘Test and processes for imposing regulation’. This is also done at page 17 as follows: “[t]here is also debate about whether the current purpose statement for Part 4A of the Act is appropriate given that there is no explicit reference to a key regulatory objective of providing for incentives to invest.” At page 19, the Explanatory Note similarly refers to “a purpose statement that explicitly states that the objective of regulation is to improve efficiency and to protect consumers from excessive prices.” Finally, at page 20, it notes that the purpose statement was adopted because it “includes both efficiency and distributional objectives, to provide for an appropriate balance between the protection of consumers and that of producers and investors.” This approach of referring to (a) to (d) as objectives is also evident at page 2 of the Select Committee Report (refer: Commentary to the Commerce Amendment Bill (201-2), Government Bill, as reported from the Commerce Committee, Wellington, 28 July 2008) and also at page 5 where the report explicitly refers to “regulatory objectives set out in the purpose statement” when recommending the new s 53A, which was subsequently adopted.

⁵⁹ Explanatory Note, supra n 16, p. 4.

⁶⁰ CIAL, *Submission on Input Methodologies and Information Disclosure Draft Determinations and Reasons Papers for Airport Services*, 12 July 2010, paragraph 25; Powerco Limited, *Submission 1 in Response to Draft Input Methodology and Information Disclosure Determinations*, 9 August 2010, paragraph 26.

⁶¹ Orion New Zealand Limited, *Submission on Input Methodologies: Draft determination and reasons papers for Electricity Distribution Businesses*, 9 August 2010, paragraph 1.7.

⁶² Electricity Networks Association, *Submission 1 Regulatory Framework*, 9 August 2010, paragraph 13.

⁶³ Unison Networks Limited, *Cross-submission on Commerce Commission Draft Input Methodology Determinations 2 September 2010*, paragraph 13.

- 2.4.7 As discussed in subsequent chapters of this Paper, in relation to the IMs for electricity distribution services, gas distribution services and gas transmission services, the Commission has considered what outcomes would be consistent with those produced in workably competitive markets such that the objectives in paragraphs (a) to (d) of the Part 4 Purpose are achieved. In deciding on the appropriate IMs as a result of this exercise, the Commission has had to exercise its judgement—for instance, there is a natural tension between providing suppliers with incentives to invest and limiting their ability to extract excessive profits.
- 2.4.8 Electricity lines services and gas pipeline services are regulated under Part 4. By definition the legislature has determined that markets in which these services are supplied are *not* workably competitive.⁶⁴ Nevertheless, s 52A(1) requires the Commission to promote outcomes that are **consistent with** outcomes produced in workably competitive markets. Guidance as to which of the variety of outcomes produced in workably competitive markets should be promoted by the Commission is provided by the regulatory objectives in s 52A(1)(a)-(d).

Definition of consumer in Part 4 for EDBs and GPBs

- 2.4.9 Section 52C of the Act defines the term ‘consumer’ as “a person that consumes or acquires regulated goods or services”. The use of both ‘consumes’ and ‘acquires’ suggests that the definition extends beyond end-use consumers and includes both direct and indirect acquirers.
- 2.4.10 The Commission notes that in its Draft IMs for EDBs and GPBs published in July 2010, the Commission took the view that ‘consumer’ should be defined with reference to the definition set out in ss 54C and 55A of the Act, which define electricity lines services and gas pipeline services respectively (i.e. regulated services). ‘Consumer’ has the narrower meaning of end-use consumers (as provided in section 2(1) of the Electricity Act 1992, and section 2(1) of the Gas Act 1992) in ss 54C and 55A.
- 2.4.11 No parties submitted on this view. However, on reflection the Commission considers that:
- the narrower definition in ss 54C and 55A should only be used for the threshold tests in those sections; and
 - the wider definition in s 52C is the appropriate definition of ‘consumer’ for the purposes of the IM Determinations.⁶⁵
- 2.4.12 The Commission has carefully reviewed its Determinations to check that they are consistent with the wider definition of consumer in s 52C and confirms that no

⁶⁴ Section 52G(1)(a) provides that goods or services may be regulated under Part 4 only if they are supplied in markets where there is little or no competition and little or no likelihood of a substantial increase in competition.

⁶⁵ In the IM Determinations for EDBs, GDBs and GTBs, it is useful to refer to ‘consumers’ in accordance with the definitions in ss 54C or 55A (as applicable), given that in the context where the term is applied, end-user consumers are the relevant consumers.

consequential changes to the Draft IMs were necessary as a result of this change in view.⁶⁶

Concept of competition in Part 4

- 2.4.13 As with all other parts of the Commerce Act, ‘competition’ in the context of Part 4 means ‘workable or effective competition’ (s 3(1)). In order to identify what outcomes are consistent with those produced in *workably* competitive markets, the Commission has first considered how the concept of workable competition is traditionally interpreted, in both economic and legal terms (paragraphs 2.5.1-2.5.18).
- 2.4.14 The Commission has also considered what factors influence workably competitive market outcomes, the extent to which those factors characterise regulated markets and what “outcomes consistent with those produced in workably competitive markets” means in the context of regulated markets (paragraphs 2.6.1-2.6.21). Specifically, the Commission has considered the outcomes in workably competitive markets in light of the regulatory objectives set out in paragraphs (a) to (d) of s 52A(1) (paragraphs 2.6.27-2.6.33).

Part 4 Purpose and regulatory instruments

- 2.4.15 In the case of EDBs and GPBs, Part 4 provides that default/customised price-quality regulation and information disclosure regulation are the primary mechanisms by which the Commission promotes outcomes consistent with those produced in workably competitive markets. Consequently, this chapter also considers how these types of regulation under Part 4 can promote the Part 4 Purpose (paragraphs 2.7.1 - 2.7.14).

Part 4 Purpose and IMs

- 2.4.16 It is in combination with each other, and with other requirements in the s 52P determinations under Part 4 for default/customised price-quality regulation and information disclosure regulation, that IMs will provide incentives for regulated suppliers to act in a manner consistent with the Part 4 Purpose. This chapter concludes by setting out the relationship of IMs to the regulatory instruments (paragraphs 2.8.1 - 2.8.35).
- 2.4.17 Given that the outcomes the IMs will promote are being postulated for markets which are not workably competitive, the extent to which workably competitive market outcomes are relevant in assisting the Commission in its decision-making has varied across IMs. Certain outcomes produced in workably competitive markets may be relevant or observable to a greater or lesser extent depending on the IM. More significantly, outcomes that are potentially relevant to particular IMs in some workably competitive markets might not be desirable in workably competitive markets with similar characteristics to those regulated under Part 4.
- 2.4.18 At all times, the Commission has borne in mind the extent to which the outcomes in question are consistent with the regulatory objectives in s 52A(1)(a)-(d). Again, the Commission has found that not all of the objectives are equally relevant across all the IMs (paragraph 2.8.38).

⁶⁶ The definition of ‘consumer’ in relation to electricity lines services is also discussed in the Transpower Reasons Paper.

2.4.19 There are, in many cases, practical constraints (for example, limits on available information, for instance about the regulated part of a business) on the Commission's ability to design IMs that, when applied to a particular regulatory instrument, will promote outcomes consistent with those in workably competitive markets. Therefore, in weighing the various options for setting IMs, the Commission has considered the extent to which each option is likely, over time, to move outcomes closer towards, rather than further away from, outcomes consistent with workably competitive markets.

2.5 Workable Competition

Workable competition in economics and competition policy

2.5.1 Given the importance of 'workable competition' in the Part 4 Purpose, the Commission has considered how the concept is interpreted in economic and legal terms. The concept of workable competition (and effective competition) was first developed by the economist J. M. Clark to provide a more realistic standard for competition policy decisions than theoretical economic models such as perfect competition.⁶⁷ For example, the OECD describes workable competition as:

a notion which arises from the observation that since perfect competition does not exist, theories based on [perfect competition] do not provide reliable guides for competition policy.⁶⁸

2.5.2 In contrast to the theoretical model of perfectly competitive markets, in which market participants are simply passive 'price takers', suppliers in workably competitive markets actively seek out and find opportunities for profitable investment and innovation. These are two of the main drivers of productivity improvements in the economy. Workable competition is therefore a *dynamic* process of rivalry between competing suppliers through which knowledge is both generated and discovered, with market prices being one of the primary ways that information is disseminated to market participants.⁶⁹

2.5.3 Furthermore, unlike 'perfect' models of competition—in which very specific 'equilibrium' outcomes arise as a result of a number of strict and unrealistic underlying assumptions—'workable' competition encompasses a wide range of outcomes.⁷⁰ As a consequence, workably competitive market outcomes are harder to define with precision. For example, the OECD states that:

⁶⁷ Clark, J.M., Toward a Concept of Workable Competition, *American Economic Review*, 30(Jun), 1940, pp. 149-157. The concept of 'workable competition' articulated by Clark in this paper was essentially a static concept, rather than a dynamic concept. Clark later favoured a more dynamic concept of competition to that which he first articulated in 1940. He went on to attempt to define various criteria for this concept using the term 'effective competition' (i.e. Clark, J.M., *Competition as a Dynamic Process*, The Brookings Institution, Washington DC, 1961, p. 450).

⁶⁸ OECD, Glossary of Industrial Economics and Competition Law, p. 85, available at: <http://www.oecd.org/dataoecd/8/61/2376087.pdf>.

⁶⁹ Likewise, in the context of Parts 2 and 3 of Act, the Commission describes workable competition as a 'dynamic process' (e.g. Commerce Commission, *Mergers and acquisitions guidelines*, December 2003, p. 12).

⁷⁰ In economics, equilibrium usually refers to the point at which supply and demand are in balance, and market conditions are not changing. At this point, the price level is such that the amount that consumers seek to buy is exactly equal to the amount that suppliers are able to produce.

No consensus has arisen over what might constitute workable competition but all bodies which administer competition policy in effect employ some version of it.⁷¹

2.5.4 Likewise, the Commission's Experts describe workable competition as follows.

Workable competition, or as is often called in competition law, effective competition, signifies that the relevant competitive process, whatever its precise structure, is, or is capable of, producing outcomes in terms of economic efficiency and consumer welfare that, at a minimum, are considered satisfactory or acceptable. ...

Since the economic organisation of an industry or market tends, over time, to adapt to its own relevant circumstances (the economic environment), market structures, economic institutions and business practices can vary significantly from one industry/market to another. Each may be competitive, but competitive in ways that might vary from those of another industry/market. It is not to be expected, therefore, that a workable or effective competition standard will be narrowly prescriptive as to the types and forms of economic organisation and business conduct that might be considered consistent with such competition. Indeed, there has been considerable debate in the literature over the indicia of workable competition.

On the other hand, the concept is far from permissive of all forms of economic organisation and business conduct. For example, early developers of workable competition approaches tended to clearly describe (and seek to justify) explicit criteria to guide decisions over whether competition was and was not workable. Notwithstanding that there was, and remains, disagreement over the set of relevant indicators, most competition laws around the world rely (at least implicitly) on some notion of workable or effective competition.⁷²

2.5.5 Definitions of workable competition found in the economic literature often encompass a variety of market structure, conduct and performance criteria (or indicators) that would be expected to be observed in order for the markets concerned to be considered workably competitive. While there is some controversy among economists in respect of the structure-conduct-performance approach,⁷³ it is nonetheless a common approach used by competition authorities for analysing competition and market power.

2.5.6 In the Structure-Conduct-Performance ('SCP') paradigm proffered by economists, the first two criteria—structure and conduct—relate to factors such as the number of firms in the market and the way that those firms behave. These criteria are therefore particularly relevant to the promotion of workable competition under Parts 2 and 3 of the Act. In the context of Part 4 (i.e. economic regulation), the structure and

⁷¹ OECD *supra* n 68, p. 86.

There are other theoretical economic models of competition, such as 'perfect contestability' (e.g. Baumol, W., Panzar, J. and Willig, R., *Contestable Markets and the Theory of Industry Structure*, 2nd ed, Harcourt Brace Jovanovich, New York, 1988). The model of perfect contestability also differs from the concept of workable competition in that, like perfect competition, it is based on very strict and unrealistic underlying assumptions.

⁷² Yarrow, G., Cave, M., Pollitt, M., Small, J., *Asset Valuation in Workably Competitive Markets - A Report to the New Zealand Commerce Commission*, May 2010 ('Asset Valuation Report'), p. 7.

⁷³ For example: "While the structure-conduct-performance relationship is subject to debate, it nevertheless provides a useful framework", Viscusi, K., Vernon, J. and Harrington J. Jr., *Economics of Regulation and Antitrust*, The MIT Press, Cambridge, Massachusetts, 3rd ed., 2000, pp. 61-63. This debate tends to centre on the difficulties in measurement in structure-conduct-performance studies, and not the performance criteria themselves. For example, a survey of the traditional and modern applications of the structure-conduct-performance approach is presented in Chapter 8 of Carlton, D.W. and Perloff, J.M., *Modern Industrial Organization*, Pearson Addison Wesley, Boston, 4th ed. 2005. Notably, Carlton and Perloff state that: "Market performance is the success of a market in providing benefits for consumers", at p. 244.

conduct criteria are less relevant than the performance criteria. This is because there is little or no competition in the markets regulated under Part 4, and little or no likelihood of a substantial increase in competition. The performance criteria reflect the outcomes that are generally deemed to be the beneficial result of the rivalrous process of competition, and are therefore also relevant to the desired outcomes under Part 4.

2.5.7 A number of attempts have been made to define the SCP criteria for workably competitive markets in the academic literature. Key performance criteria typically involve:

- efficient production and distribution;
- profits at levels just sufficient to reward investment, efficiency, and innovation;
- prices that encourage rational choice, guide markets toward equilibrium, and do not intensify cyclical instability;
- output levels and product quality (that is, variety, durability, safety, reliability, and so forth) responsive to consumer demands;
- success accruing to sellers who best serve consumer wants; and
- appropriate exploitation of improved products and techniques.⁷⁴

2.5.8 It is notable that the SCP definition of workable competition—and the performance criteria in particular—reflects wide recognition by economists that competitive pressures would be expected to move market participants closer towards, rather than further away from, *efficient* outcomes that are beneficial to consumers over time. The three dimensions of efficiency usually identified are allocative, productive and dynamic efficiency.

- *Allocative efficiency* occurs when resources are allocated within the economy to the uses in which they have the highest value.
- *Productive efficiency* is present when producers use inputs in such a manner as to minimise costs, subject to technological constraints.
- *Dynamic efficiency* refers to decisions made over time and includes decisions relating to investment and/or innovation that can improve productivity as well as the range and quality of services.

2.5.9 One submitter strongly argued that efficiency considerations should be the cornerstone of regulation that seeks to promote outcomes consistent with workable competition.⁷⁵

⁷⁴ These performance criteria are drawn from the similar lists provided in the 'Workable Competition' section in Chapter 2 of Scherer, F. and Ross, D., *Industrial Market Structure and Economic Performance*, 3rd ed., Houghton Mifflin, Boston, 1990, pp. 52-55, and in Chapter 7, 'Workable Competition', of Reid, G. C., *Theories of Industrial Organisation*, Basil Blackwell, New York, 1987, p. 125.

- 2.5.10 The promotion of efficiency is undoubtedly a key characteristic of workably competitive markets, but by no means the only one. As is discussed further below (paragraphs 2.6.15-2.6.33), in the context of Part 4, the regulatory objectives set out in s 52A(1)(a)-(d) encompass a wider range of performance areas than efficiency alone (let alone one particular dimension of efficiency).

Workable competition in competition law

- 2.5.11 Definitions of workable competition are also found in legal precedent. Many of the SCP criteria are echoed in various provisions in the Act and the Fair Trading Act 1986 (as well as aspects of other sector-specific legislation such as the Credit Contracts and Consumer Finance Act 2003). Importantly, the SCP framework has been applied as part of the Commission's, and the Courts', analytical approach to assessing restrictive trade practices under Part 2 and business acquisitions under Part 3 of the Act.
- 2.5.12 Legal definitions of workable competition tend to characterise it as acting to limit firms in their ability to set their own price and profit levels. For example, the Courts in New Zealand have generally approved the Australian Trade Practices Tribunal's discussion in *Re Queensland Co-operative Milling Association Ltd: Re Defiance Holdings Ltd. (QCMA)*, as to the particular elements and principles that underlie workable competition. The discussion in QCMA draws attention to the US Attorney-General's observation that:

... the basic characteristic of effective competition in the economic sense is that no one seller ... has the power to choose its level of profits by giving less and charging more. ... **the antithesis of competition is undue market power** in the sense of the power to raise price and exclude entry.⁷⁶

- 2.5.13 In New Zealand, the High Court in *ARA v Mutual Rental Cars (Auckland Airport) Ltd* and *Fisher and Paykel Ltd v Commerce Commission*⁷⁷ has approved the following formulation of workable competition:

Workable competition means a market framework in which the pressures of other participants (or the existence of potential new entrants) is sufficient to ensure that each participant is constrained to act efficiently and in its planning to take account of those other participants or likely entrants as unknown quantities. To that end **there must be an opportunity for each participant or new entrant to achieve an equal footing with the efficient participants in the market** by having equivalent access to the means of entry, sources of supply, outlets for product, information, expertise and finance. This is not to say that particular instances of the items on that list must be available to all. That would be impossible. For example, a particular customer is not at any one time freely available to all suppliers. **Workable competition exists when there is an opportunity for sufficient influences to exist in any one market which must be taken into account by each participant and which constrain its behaviour.**⁷⁸

⁷⁵ Frontier Economics, *Input Methodologies Draft Reasons Paper*, for Air New Zealand, July 2010, p. 2.

⁷⁶ (1976) 8 ALR 481 (emphasis added).

⁷⁷ *Auckland Regional Authority v Mutual Rental Cars (Auckland Airport) Ltd* [1987] 2 NZLR 647, p. 671.

⁷⁸ *Fisher & Paykel Ltd v Commerce Commission* [1990] 2 NZLR 731, 759 (emphasis added). This does not imply that competitors should actually be placed on an equal footing, as: "Competition is a means to the end of protecting the interests of consumers, rather than competitors in the market" (*Universal Music Australia v Australian Competition and Consumer Commission* (2003) 131 FCR 529 (FCA)).

Constraints on market power in workably competitive markets

2.5.14 The previous quote highlights that workable competition can be considered to exist where there is an opportunity for sufficient influences to constrain the market power of existing market participants. During the consultation process, a number of submissions from regulated suppliers have presented arguments that rely on a standard of workable competition whereby (hypothetical) new entrants are considered to always provide the greatest constraint on the market power of incumbent suppliers. These arguments are primarily made in the context of the asset valuation IM and are therefore discussed in more detail in Chapter 4.⁷⁹ However, in light of the economic and legal interpretations of workable competition introduced above, it is worth highlighting a number of points that are relevant to those arguments in this chapter of the Paper.

2.5.15 The Commission notes that Professor Michael Porter explains the structure of an industry as being embodied in not just *one*, but *five* competitive forces:

- the power of buyers (i.e. consumers);
- the power of suppliers to the industry (i.e. upstream suppliers to the suppliers in the industry);
- the threat of new entrants;
- the threat of substitute goods or services; and
- the rivalry among existing competitors.⁸⁰

2.5.16 Porter explains that the strongest forces in a particular case will be the one(s) that constrain the behaviour of firms within an industry.

Different forces take on prominence, of course, in shaping competition in each industry. In the ocean-going tanker industry the key force is probably the buyers (the major oil companies), while in tires it is powerful OEM [original equipment manufacturer] buyers coupled with tough competitors. In the steel industry the key forces are foreign competitors and substitute materials.

Every industry has an underlying structure, or set of fundamental and technical characteristics, that gives rise to these competitive forces.⁸¹

2.5.17 Similarly, the definition of workable competition in *ARA v Mutual Rental Cars (Auckland Airport) Ltd* and *Fisher and Paykel Ltd v Commerce Commission* also highlights that it is not just new entrants that can influence and constrain the behaviour of existing market participants.⁸²

⁷⁹ For example, PwC (on behalf of Christchurch International Airport Limited), *Response to the Discussion of Asset Valuation in the Draft Decisions Document*, 12 July, 2010, pp. 15-18; and PwC (on behalf of Powerco), *Response to the Discussion of Asset Valuation in the Draft Decisions Document*, 19 August 2010, p. 16-18.

⁸⁰ Porter M.E., *On Competition*, Harvard Business Review Book Series, Boston, MA, 1998, p. 86.

⁸¹ *ibid* p. 23.

⁸² A recent survey of the Australasian case law on the meaning of “workable and effective competition” is provided in: Land J., Owens J., and Cejnar L., The meaning of “competition”, *New Zealand Universities Law Review*, Vol. 24, June

2.5.18 Consequently, despite the submissions of a number of regulated suppliers, in applying outcomes produced in workably competitive markets to regulated markets, there appears to be no strong grounds for limiting the analysis to scenarios where potential new entrants provide the only relevant constraint on the market power of incumbents. Whether existing competitors, substitute goods or services, or new entrants provide the limiting constraint on a particular incumbent supplier will depend on the characteristics of the industry in question.

2.6 Workable Competition and the Part 4 Purpose

Factors influencing competitive market outcomes

2.6.1 In light of the meaning of ‘workable competition’ discussed in the previous section, the Commission has considered what factors influence workably competitive market outcomes, and the extent to which those factors characterise regulated markets (and also the extent to which those factors are absent). In particular, the Commission has considered what ‘outcomes consistent with those produced in workably competitive markets’ means in the context of regulated markets.

2.6.2 A number of real-world markets cannot be considered workably competitive and may not consistently produce desirable outcomes for consumers in the long-term. Competition law and economic regulation exist in OECD countries for this very reason. Neither the economic nor legal descriptions of workable competition are so broad as to simply mean any form of observed real-world competition, or any apparent price rivalry between firms that might last for just a short period.

2.6.3 Workably competitive market outcomes represent a desired set of outcomes, derived from the relevant economic concepts and legal precedent, but they reflect only a subset of observed outcomes in real-world markets. Furthermore, given that Part 4 relates to markets with little or no competition (or those with little or no likelihood of a substantial increase in competition), not all workably competitive market outcomes are likely to be relevant to regulated markets. In determining which particular outcomes should be promoted under Part 4, the Commission is guided by the regulatory objectives in s 52A(1)(a)-(d), and the central purpose of promoting the long-term benefit of consumers.

2.6.4 An illustrative list of some of the more important factors likely to affect outcomes in real-world competitive markets, and therefore likely to affect the extent to which those outcomes can be considered consistent with outcomes in workably competitive markets, include:⁸³

- the extent of market power (which can itself be influenced by many of the following factors);
- the extent of ‘economies of scale’—economies of scale arise when the per unit cost of producing goods or services decreases as the quantity produced of those goods or services increases;

2010, pp. 98-112. The survey similarly highlights that competitive constraints on market power can come from a range of sources.

⁸³ For example: Yarrow et al., Asset Valuation Report, supra n 72, pp. 10-16.

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- the extent of ‘economies of scope’—economies of scope arise when it is less expensive to produce different types of goods or services together (such as in a single firm) rather than separately (such as in two distinct firms);
 - the extent of ‘sunk costs’—sunk costs occur when investments, once committed to a specific use, are ‘irreversible’, meaning that the assets employed are ‘specialised assets’ which have a much lower value in any alternative use (e.g. an electric power cable has limited alternative uses);⁸⁴
 - the extent to which investments are durable and/or indivisible (i.e. where asset capacity is not perfectly matched to demand because it would not be efficient to do so on a lifecycle basis, and/or the assets are only available in certain fixed sizes);
 - the extent of contracting (and the terms and conditions of those contracts, including their duration)—in particular, contracts in workably competitive markets tend to manage risks efficiently, by allocating identified risks to the party considered best placed to manage them;
 - the costs of replacing assets (which will be affected, at any point in time, by supply and demand conditions in input markets);
 - the relative efficiencies of firms within a market; and
 - the expectations of demand growth or decline.

2.6.5 To give an indication of how these factors affect whether a market can be considered workably competitive or not, consider a situation where the presence of economies of scale or scope can *potentially* give rise to market power. If there are sufficient influences acting on firms that constrain that market power—such as the presence of a number of similar incumbent firms ensuring that, among other things, the profits of all firms are at levels just sufficient to reward investment, efficiency and innovation—the market might well be workably competitive.

2.6.6 The actual outcomes in that workably competitive market will differ depending on some of the other factors above. For example, if the sunk costs are very significant, long-term contracting between suppliers and consumers might be more common, potentially causing market prices to be influenced as much by historical events and costs as by current and expected future market conditions (paragraph 2.6.25). On the other hand, if there is unconstrained market power in the first instance, it is unlikely that the market would be considered workably competitive at all.

Relevant characteristics of regulated markets

2.6.7 Many regulated markets are characterised by long-lived specialised infrastructural investments, which typically exhibit economies of scale and/or economies of scope to an extent that it is often more efficient for a single supplier to provide services (at

⁸⁴ In particular, the costs of installing (i.e. trenching) the cable, which will be capitalised into the total value of the cable, are generally irreversible and as such can be considered ‘sunk’. Even if the cable were to have some value in an alternative use—such as its scrap value from selling the salvaged copper or aluminium—this value will be net of the costs involved in decommissioning the cable from its existing use.

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- least in a particular area). The term ‘natural’ monopoly refers to the situation where the most efficient market structure from a societal perspective would be for a single efficient firm to supply the market in question.
- 2.6.8 In addition, investments in infrastructural markets tend to be durable and indivisible (i.e. ‘lumpy’), and have no alternative use other than in the supply of the current services (i.e. once capital is committed, such service- or market-specific investments are sunk). These factors create substantial barriers to entry and exit in the relevant market.⁸⁵
- 2.6.9 A number of submissions from regulated suppliers have argued that the most relevant insights are those derived from “better functioning” workably competitive markets—in other words, those with minimal (if any) barriers to entry and exit.⁸⁶ These arguments are primarily made in the context of the asset valuation IM and are therefore discussed further in Chapter 4. However, as with the related comments above concerning the constraints on market power from hypothetical new entrants, it is worth highlighting a number of points that are relevant to those arguments in this chapter.
- 2.6.10 In the markets regulated under Part 4, barriers to entry and exit are likely to significantly limit any credible threat of competitive pressure from new entrant suppliers seeking to ‘contest’ the market.⁸⁷ The barriers created give rise to a level of market power that, left unchecked, could produce outcomes that are not consistent with those produced in workably competitive markets.
- 2.6.11 In workably competitive markets, incumbent suppliers may have an absolute cost advantage over new entrants where long-lived specialised assets are required to supply consumers with services, and the incumbents have already invested in such assets. Such an absolute cost advantage is less likely to arise where the costs of replacing assets are decreasing (such as due to technological change), but is more likely to arise in situations where the costs of replacing assets are increasing rapidly (e.g. faster than inflation). This would particularly be the case if entrants would need to replicate at least some of the incumbents’ existing assets, and if the capacity of those assets is not yet fully utilised, which is more likely to occur where assets are indivisible (paragraph 2.6.4).
- 2.6.12 Although such an absolute cost advantage would, if present, create barriers to entry for new entrants, this does not necessarily mean the market is not workably

⁸⁵ Barriers to exit can occur when an incumbent supplier cannot transfer its assets out of supplying services in a particular market. Such barriers to exit will also deter new entrants as, following entry, entrants would expect the incumbent to remain in competition with them and engage in retaliatory price changes.

⁸⁶ For example, PwC (on behalf of Christchurch International Airport Limited), *Response to the Discussion of Asset Valuation in the Draft Decisions Document*, 12 July, 2010, p. 3; and PwC (on behalf of Powerco), *Response to the Discussion of Asset Valuation in the Draft Decisions Document*, 19 August 2010, p. 11.

⁸⁷ Contestability theory (Baumol et al., supra n 71) maintains that the presence of natural monopoly does not in itself indicate the existence of market power, if the threat of new entry constrains prices to those that would occur in a competitive market. A perfectly contestable market assumes that entry is not impeded by fear of retaliatory price changes, and similar to the legal concept of workable competition (paragraphs 2.5.11-2.5.13) it is assumed that hypothetical new entrants and incumbents are able to compete on completely ‘symmetric’ terms (i.e. on an ‘equal footing’). Unlike workable competition, however, the economic model of perfect contestability requires there to be no barriers to entry or exit, which means that the incumbent firm would not make any sunk investments (ibid., pp. 349-350).

competitive. There may be other constraints or influences on the market power of incumbents which ensure that they cannot choose their level of profits by charging more (paragraph 2.5.12), and which limit profits to levels just sufficient to reward investment efficiency and innovation (paragraph 2.5.7). For example, as noted above (paragraphs 2.5.15-2.5.16), incumbents may be constrained by the threat of substitute services, by the buying power of consumers (such as through explicit or implicit long-term contracting arrangements—refer paragraphs 2.6.22-2.6.25), or through rivalry amongst the existing incumbents themselves.

- 2.6.13 In a regulated market context, where an incumbent supplier uses long-lived specialised assets to supply services and, as a result, can supply the market over time at a lower cost than a hypothetical new entrant,⁸⁸ it would be inappropriate to use the characteristics of the higher cost hypothetical new entrant as a benchmark for setting or monitoring the prices of regulated suppliers. Doing so is not required to provide the incumbent supplier with the incentive to innovate, or to invest and operate efficiently, and could provide a windfall reward for the supplier with no consequential long-term benefits to consumers.
- 2.6.14 Thus, arguments that rely on the threat of entry to constrain the behaviour of incumbents, would therefore amount to assuming away those characteristics which create the market power that warrants regulatory intervention in the first place—namely, the barriers to entry created by investments in lower cost long-lived specialised assets.

Outcomes consistent with workably competitive markets in the context of regulated markets

- 2.6.15 As noted above (paragraph 1.2.5), the economic regulation of markets with the characteristics discussed in the previous subsection is sometimes described as an attempt to ‘mimic’ the competitive market process, or to achieve the same outcomes as workable competition, if it were feasible.
- 2.6.16 The Commission’s Experts have, however, highlighted the challenges for a regulatory body like the Commission in using workably competitive market outcomes as a guide for economic regulation, and for implementing Part 4 in particular. For instance, Professor Yarrow has stated that:

It is immediately apparent that the Commission is faced with a tricky task. ...

[W]hilst the central policy concerns relate to monopolized markets, the stars by which the Commission is to steer are those that are associated with competitive markets.

The task is not made easier by the fact that the term ‘competitive market’ can itself be applied to a range of economic environments that can differ substantially from one

⁸⁸ Where the market has natural monopoly characteristics, a hypothetical new entrant would generally be expected to be able to enter the market successfully only by constructing assets sufficient to meet the *entire* market demand. By contrast, the incumbent only needs to construct assets necessary to meet *incremental* demand. On the one hand, a hypothetical new entrant may benefit from greater economies of scale and scope than the incumbent, given that the incumbent’s assets have grown incrementally in the past to meet demand, whereas a new entrant might have a better opportunity than the incumbent to optimally configure and size its assets to meet current and forecast market demand. On the other hand, if hypothetical new entrants do not have access to the same, and cheaper, sources of supply as the incumbent—i.e. the incumbent’s long-lived specialised and already sunk assets—a hypothetical new entrant will not be able to achieve an ‘equal footing’ with the incumbent (paragraph 2.5.13).

another. Competition means rivalry, and rivalry can take many different forms and can occur in many different contexts. Considerable work is therefore required, if, from the broad canvas of possible ‘competitive outcomes’, policy approaches are to be developed which can usefully guide future regulatory decisions, and which can provide the certainty in relation to regulatory rules, requirements and processes which is required by the legislation.⁸⁹

2.6.17 Professor Yarrow went on to consider how the concept of workable (or effective) competition can guide the Commission in its task of determining IMs under Part 4.

Speaking roughly, effective competition tends to involve:

- Strong incentives: outcomes matter a lot to the competitors.
- Reasonably well matched capabilities: each competitor believes that he/she has a reasonable shot at winning some of the prizes.
- The principal dimension of rivalry is to better serve consumers/customers: the focus of competition is on winning the customer’s business.

Section 52A captures these notions in its references to incentives, benefit sharing and limited ability to extract excess profits, and in the use of the notion of *promotion* of certain *broadly defined* types of outcome (in contrast to the more bureaucratic-managerial idea of achieving very *specific* outcomes).⁹⁰

[R]egulatory economists are fond of saying that good regulation should seek to replicate the outcomes of competitive markets. Indeed, the Draft Reasons paper itself quotes one of the leading regulatory economists to this effect:

“2.6.21 Likewise, in his seminal text on economic regulation, Alfred Kahn states that: “the single most widely accepted rule for the governance of regulated industries is regulate them in such a way as to produce the same results as would be produced by effective competition, if it were feasible.”

Most of us in the trade have said something similar at some point in our careers, but it is important to understand why it is wrong, so as to avoid future pitfalls when developing regulatory rules.

In the Kahn statement, the killer words are “if it were feasible”. If it were feasible, we wouldn’t nowadays want to regulate. We regulate because it is not feasible, and because it is not feasible we don’t know what results competition will produce, *except possibly in static economic conditions with perfect information*. Outside this narrow, and entirely imaginary, economic environment (perfect information), it is impossible to produce the “same results” (which are both unknown and unknowable) as effective competition; and within the narrow environment of perfect information competition will produce results that are inferior to regulated monopoly, and hence would not usually be defined as workable or effective.

For reasons given above, this is not fatal to the exercise of using the notion of workable competition as a guide when developing regulatory rules. Wisely, the NZ legislation does not require the Commission to *achieve the same outcomes/results* as would be produced by competition, but rather to *promote* rather *broadly defined* outcomes (which, to better avoid ambiguity, by explicitly distinguishing them from specific, precise, measurable outcomes, might better have been described as *tendencies*) that are *consistent* with those produced in competitive markets. These tendencies are then

⁸⁹ Yarrow, G., *Review of Input Methodologies (Airports Services) Draft Reasons Paper*, June 2010, pp. 3-4.

⁹⁰ *ibid*, p. 4.

exemplified in terms of incentives and benefit sharing, not in terms of specific, well defined outcomes/results.⁹¹

- 2.6.18 Significantly, the Part 4 Purpose does not require the Commission to *achieve* workably competitive outcomes. Rather, the Part 4 Purpose requires the Commission to *promote* outcomes *consistent with* workably competitive outcomes.
- 2.6.19 A number of submissions from regulated suppliers have argued that the reference to workably competitive markets in Part 4 implies a single set of outcomes. Specifically, some of these submissions argue the only relevant set of outcomes is that which is consistent with the ‘long-run equilibrium’ condition in the relevant market. These arguments are primarily made in the context of the asset valuation IM and are discussed in more detail in Chapter 4.⁹²
- 2.6.20 At this stage of the Paper, however, it is worth highlighting the views of the Commission’s Experts, who have addressed this issue as part of their Review of Submissions on the Draft Decisions Paper. Although a key performance criterion of workably competitive markets is that prices guide markets *toward* equilibrium:
- Long-run equilibrium in workably competitive markets is not just ill-defined, it need not even exist. ... “The pursuer never actually catches the pursued, but he is always chasing after him.”⁹³
- 2.6.21 Unlike theoretical economic models of competition such as perfect competition and perfect contestability, workable competition does not come with a set of pre-defined conditions for long-run equilibrium that dictate what the associated set of outcomes must be. Consequently, the theoretical concepts of competition presented by some submitters have provided less useful guidance to the Commission than the concept of workable competition discussed above, which recognises there are a range of factors that can influence workably competitive market outcomes (paragraph 2.6.4).
- 2.6.22 To illustrate this point, the Commission for example agrees with its Experts who suggest that workably competitive markets involving long-term contracting can provide some useful insights when evaluating various options for setting IMs, particularly in the case of the IM for asset valuation (refer Chapter 4). Although long-term contracts are by no means ubiquitous in many real-world markets, the Commission considers that long-term contracts can provide useful insights because:
- they tend to be more prevalent in workably competitive markets that have a number of similar characteristics to the markets regulated under Part 4; and
 - irrespective of how prevalent such contracts are in actual markets, when they do occur they can be more likely to promote outcomes consistent with

⁹¹ *ibid*, pp. 5-6 (emphasis in original).

⁹² For example, PwC (on behalf of Christchurch International Airport Limited), *Response to the Discussion of Asset Valuation in the Draft Decisions Document*, 12 July, 2010, pp. 8-11 and 15-17; and PwC (on behalf of Powerco), *Response to the Discussion of Asset Valuation in the Draft Decisions Document*, 19 August 2010, pp. 8-11 and 15-17.

⁹³ Refer: Yarrow, G., Cave, M., Pollitt, M., Small, J., *Review of Submissions on Asset Valuation in Workably Competitive Markets - A Report to the New Zealand Commerce Commission*, November 2010 (Submissions Review), p. 26.

workably competitive markets, and to reflect the objectives in s 52A(1)(a) to (d), than would otherwise be the case—i.e. if no such contracts existed.⁹⁴

- 2.6.23 Workably competitive outcomes can be promoted through contractual arrangements where consumers seek competitive tenders (including proposed price, quality and/or quantity terms) from potential suppliers prior to awarding a contract. Consumers are then able to select the supplier that will provide them with the best combination of expected outcomes over the duration of the contract, and then fix the winning combination of conditions in the contract. Where specialised long-lived assets are employed, such arrangements also protect suppliers against the risk that they will not be able to earn a return on those assets, thereby encouraging investment in new infrastructure.⁹⁵ As a result, one view is that “the market response to sunk cost and attendant risk is the long-term contract”, and “judging by the large number of long-term contracts, sunk costs are a common phenomenon”.⁹⁶
- 2.6.24 Implicit long-term contracting can also occur when the economic relationship between suppliers and consumers is of an ongoing nature. Short-term profit-seeking behaviour by a supplier might damage its reputation with established customers, who might choose to switch their business to rivals considered to be more ‘reliable’ or ‘less opportunistic’ in their pricing.⁹⁷
- 2.6.25 Once contract terms are fixed (or are implicit in an ongoing relationship), price and quality outcomes are then affected by ‘historical events’. This is because the terms reflect the economic conditions and expectations at the time the explicit or implicit contract was struck, which may be significantly different from present conditions.⁹⁸
- 2.6.26 It is important to note, however, that regulatory arrangements under Part 4 are not explicitly intended to promote the outcomes of long-term contracting in workably competitive markets. Rather, because such contracts can effectively promote outcomes that are consistent with workably competitive market outcomes, as well as with the regulatory objectives in s 52A(1)(a)-(d), they—along with other factors—have provided some useful guidance to the Commission in setting IMs in a manner consistent with the Part 4 Purpose.

Key areas of performance relevant to workably competitive market outcomes under Part 4

- 2.6.27 Under Part 4, the regulatory objectives in s 52A(1)(a)-(d) provide guidance on the specific types of outcomes that are to be promoted through the application of IMs to default/customised price-quality regulation and information disclosure regulation.
- 2.6.28 Paragraphs (a)-(d) of s 52A(1) specifically refer to the following areas of performance, which are also reflected in the performance criteria that characterise workable competition (paragraph 2.5.7 above).

⁹⁴ Refer: Yarrow et al., Asset Valuation Report, supra n 37, pp. 27-29.

⁹⁵ For example: Shuttleworth, G., *ERGEG Paper on Tariff Principles: A Comment*, Prepared for Gas Transport Services, NERA Economic Consulting, London, 23 January 2008, p. 38.

⁹⁶ Spulber, D., *Regulation and Markets*, MIT Press, Cambridge, MA, 1989, s 1.3.3.

⁹⁷ Yarrow et al., Asset Valuation Report, supra n 37., p. 19.

⁹⁸ Yarrow et al., Asset Valuation Report, supra n 37, p. 21.

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- *Investment* (s 52A(1)(a)). In workably competitive markets, there is pressure on firms to undertake investments at an efficient level and at the socially optimal time. Superior investment decisions are rewarded by greater than normal returns (i.e. normal profits) in the short to medium term, and it is this prospect of earning above-normal returns for a period that provides incentives for efficient investment (and efficiency more generally). If a regulated firm does not expect to make at least a normal return on its efficient incremental investments going forward, it would be unable to maintain the quality of its services and would have no incentive to invest further in order to meet the growth in consumer demand.
 - *Innovation* (s 52A(1)(a)). The most significant benefits of workably competitive markets to consumers over the long-term are often considered to be incentives for dynamic efficiency—the discovery and use of new information that leads to the development of new goods and services, and to new, more efficient techniques of production. However, dynamic efficiency is not readily evaluated in advance, because its most important property is that it will lead to economically valuable information which is not known when *ex ante* assessments need to be made.⁹⁹ Consequently, although setting out clear regulatory rules and processes in advance promotes certainty, thereby providing a regulatory environment conducive to innovation (and to investment), it is a challenge for regulators to include specific regulatory provisions that directly promote innovation. In particular, where innovations improve quality rather than reduce costs, it is very difficult to promote such an outcome in a regulated market, due in part to the problems associated with measuring quality and, more significantly, in linking these to innovations.
 - *Prices and quality* (s 52A(1)(b) and (c)). Price and quality are inextricably linked because they are the two key aspects of goods and services that are often of most interest to consumers. In workably competitive markets, consumer demand is responsive to changes in price and quality. Prices provide appropriate signals for allocating resources efficiently within the economy, and provide a level of profits just sufficient to reward investment, innovation and efficiency. In the case of regulated suppliers, ensuring prices result in revenues that provide a normal rate of return is only one of the necessary conditions for allocative efficiency. Allocative efficiency is not only dependent on overall revenue, but is also dependent on individual price levels and structure, because consumers respond to the prices that they face, rather than to the revenues that firms make. Similarly, service quality is more important to consumers at an individual service level than on a whole-of-business basis.
 - *Profits* (s 52A(1)(d)). In workably competitive markets, profits are expected to be just sufficient to reward investment, innovation and efficiency. Superior performers, however, are more likely to be rewarded by receiving returns greater than a normal return, at least for the short to medium term until their competitors catch up. Over the lifetime of its assets, a typically efficient firm in a workably competitive market would expect *ex ante* to earn at least a

⁹⁹ Yarrow et al., Submissions Review, supra n 93, p. 18.

normal rate of return (i.e. its risk-adjusted cost of capital). Because allowing a firm the expectation of being able to earn normal returns over the lifetime of an investment provides it with the chance to preserve its ‘financial capital’ in real (not nominal) terms, such an outcome is often referred to as ‘financial capital maintenance’ or ‘FCM’. In a regulatory context, FCM is achieved, on an *ex ante* basis.¹⁰⁰ This is comparable to expectations in competitive markets that are conducive to promoting investment.¹⁰¹ It is not, however, possible to guarantee that regulated suppliers earn a normal return over the life of assets, because any analysis used to monitor profitability, or to set regulated prices, will typically be conducted part way through the lifetimes of the assets utilised in supplying regulated services. Some information about past performance may not be known. Further, the allocation of risks between suppliers and consumers will usually mean that, although suppliers might have expected to earn a normal return *ex ante*, such a return is not earned *ex post*.

- *Efficiency* (s 52A(1)(b)). As noted above (paragraphs 2.5.8-2.5.10), the promotion of efficiency is a key aspect of workably competitive markets, and efficiency is generally considered to comprise three dimensions. Productive efficiency relates to the costs of production. Allocative efficiency is primarily about efficient price and quality outcomes, and dynamic efficiency is related to innovation, investment and profitability over time. In workably competitive markets, efficiency gains are generally shared with consumers through lower prices and better service quality over time. As is discussed further in the next section, as in workably competitive markets, regulated suppliers will face incentives to improve efficiency where they are able to keep some of the benefits of efficiency gains.

2.6.29 Requiring information on these areas of performance to be disclosed by EDBs and GPBs would contribute to the purpose of information disclosure regulation in s 53A (paragraph 2.3.1 above). Under s 53B(2), the Commission:

- may monitor and analyse all information disclosed in accordance with the information disclosure requirements; and
- must, as soon as practicable after any information is publicly disclosed, publish a summary and analysis of that information for the purpose of promoting greater understanding of the performance of individual regulated

¹⁰⁰ For example: “In defining the costs of depreciation and allowed return, regulators should adopt rules that meet the accounting principle of ‘Financial Capital Maintenance’ (FCM), i.e. rules which allow investors to maintain the real value of their capital. This principle is a necessary condition for total cost recovery – meaning for efficient investment and for the prevention of monopoly profits. ... FCM therefore provides the standard by which investors effectively measure whether the regulatory regime is allowing them to recover their costs including a rate of return comparable with that offered by other companies and sectors” (Shuttleworth, G., *supra* n 95, pp. ii and 13). The concept of FCM underpins the decisions of regulators in many OECD countries (e.g. refer: Diewert E., Lawrence D. and Fallon J., *Asset Valuation and Productivity-Based Regulation Taking Account of Sunk Costs and Financial Capital Maintenance*, Report to the Commerce Commission, Economic Insights, Canberra, 11 June 2009, pp. 39-47).

¹⁰¹ For example: “**No commercial competitors would come into an industry if they did not expect to be able to recover the decline in real values of their assets, as well as earn a normal profit (the opportunity cost of capital).** They would measure their return on investment after recovery of funds sufficient to maintain the real value of the **financial capital** they had invested” (HM Treasury Advisory Group, *Accounting for Economic Costs and Changing Prices: A report to HM Treasury by an Advisory Group*, Vol. 1, HMSO, London, 1986, paragraph 19 (emphasis in original)).

suppliers, their relative performance, and the changes in performance over time.

- 2.6.30 A number of submissions from regulated suppliers have argued that s 52A(1)(a) is the most important limb of s 52A, and therefore the promotion of investment (and innovation) should be the Commission’s primary focus in determining IMs. In particular, Vector points, for example, to the comments from the Ministers of Commerce and Energy, upon the introduction of the Commerce Amendment Bill, that:

The Bill introduces a purpose statement specifically for this section of the Act to give clearer guidance to the Courts and the regulator that the aim of regulation is to promote investment.¹⁰²

- 2.6.31 Nevertheless, in reporting back on the Bill, the Select Committee considered similar arguments that “the primary objective in the purpose statement should be investment”, and concluded that:

Although we agree that incentives to invest are important, we consider they need to be balanced against the need to protect consumers from excessive prices.¹⁰³

- 2.6.32 A balancing between the limbs in paragraphs (a)-(d) of the Part 4 Purpose is clearly required. Ensuring that regulated suppliers have the opportunity to receive at least a normal return on their new investments provides the incentives for them to make those investments in the first place. Where those investments are made at an efficient level and time, and are employed to provide services at the appropriate quality, then consumers will benefit over the long-term. On the other hand, it is not usually in consumers’ interests to face prices which recover costs which have never been incurred, or the costs of investments that have been made well in advance of being needed. The main reason economic regulation is required is to counter the market power of firms (i.e. the ability of firms that are not faced with competition or the threat of competition to charge excessive prices and/or reduce quality— paragraph 1.2.16).

- 2.6.33 It is not particularly significant how prevalent the desired workably competitive market outcomes might be in real-world markets. Rather, the more important consideration is the extent to which promoting those outcomes is consistent with the Part 4 Purpose. In some cases, there may be a number of different, but possibly mutually exclusive, workably competitive market outcomes that might be consistent with the regulatory objectives in s 52A(1)(a) to (d), and that provide some long-term benefits to consumers. Where this is the case, the Commission has weighed up the alternatives in terms of which of the outcomes consistent with those produced in workably competitive markets (taking into account the relevant characteristics of the regulated market) is likely to achieve those objectives better, thereby promoting greater benefits for consumers in the long-term.

¹⁰² Dalziel L and Parker D, *Bill gives better incentives for infrastructure investment*, Media Statement, Minister of Commerce and Minister of Energy, 13 March 2008, cited in Vector, *Submission in Response to the Commerce Commission’s Draft Reasons Paper for Electricity Distribution Businesses and Gas Pipeline Businesses, Asset Valuation*, 23 August 2010, p. 13.

¹⁰³ Commerce Amendment Bill (201-2), Government Bill, as reported from the Commerce Committee, Wellington, 28 July 2008, p. 2.

2.7 Role of Regulatory Instruments in Promoting the Part 4 Purpose

Default/customised price-quality regulation

- 2.7.1 Generally speaking, incentive-based price-quality regulation attempts to mimic some of the pressures that rivalry exerts in workably competitive markets, thereby promoting outcomes consistent with outcomes in such markets. Whereas competitive rivalry would usually be relied upon to provide suppliers with continuous incentives to innovate, invest and improve their efficiency, price-quality regulation can act as a partial surrogate for these pressures in markets where competition is limited. At least in the short-run, suppliers should expect to earn greater than normal returns when they discover new information and create new opportunities. In the medium- to long-term, however, any 'excessive profits' should be limited, just as they would be in a workably competitive market, where vigorous and effective competition would ensure that efficiency gains are shared with consumers.
- 2.7.2 As noted above (paragraph 1.2.9), a common approach for setting incentive-based price-quality paths is referred to as 'CPI minus X' (CPI-X) due to the use of the Consumer Price Index and an 'X-factor' (relative) efficiency or productivity term in setting the regulated price path. The parameters of the CPI-X price path are generally reset every regulatory period, which is often five years. To ensure that the regulated supplier does not reduce service quantity or quality below levels that consumers demand, quality standards are typically provided for as part of incentive-based price-quality regulation. Likewise, Part 4 provides for CPI-X default or customised price paths and quality standards to be set by the Commission.
- 2.7.3 CPI-X price-quality paths implicitly recognise that regulated suppliers will face inflationary and other increasing cost pressures in respect of their incremental capital and operating expenditures during a regulatory period. In addition, however, a CPI-X price path, or in fact any form of price/revenue 'cap' (paragraphs 2.8.19-2.8.20), will place incentives on suppliers to improve their efficiency over that regulatory period, consistent with s 52A(1)(a) and (b). This is because suppliers get to keep the benefits of efficiencies greater than those implied by their CPI-X price path for a number of years (i.e. at least until the price path is reset at the beginning of the next regulatory period). Where the X-factor is positive a CPI-X path requires reduction in prices in real terms on the basis that the supplier is assessed as being in a position to share a certain level of efficiency gains with consumers.
- 2.7.4 These efficiency gains are realised by the regulated supplier in the form of higher profits, but are shared with consumers over the long-term through prices that are lower than would otherwise be the case, consistent with s 52A(1)(c). Some of this sharing can occur during the regulatory period, due to the X-factor in the CPI-X price path, given that the X-factor itself reflects some expectation of future efficiency or productivity improvements. Importantly, because regulated suppliers have an incentive to outperform the efficiency expectations implicit in the CPI-X price path, this increases the level of benefits that are potentially available to be shared with their consumers at the end of the regulatory period, when the price path is reset. Finally, given that a price path acts to limit the level of revenue that a regulated supplier can earn, if set appropriately the price path will also limit excessive profits, consistent with s 52A(1)(d).

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- 2.7.5 The quality standards element of any price-quality path is intended to ensure that, in response to the cost-reducing incentives provided by the CPI-X price path, regulated suppliers do not lower service quality below the level demanded by consumers, consistent with s 52A(1)(b).
- 2.7.6 Therefore, in the context of Part 4, price-quality paths—whether default or customised—by their very nature influence the behaviour of regulated suppliers in a manner consistent with the regulatory objectives in s 52A(1)(a)-(d). Price-quality paths comprise a number of common elements, namely: maximum revenues and/or prices, quality standards, optional incentives for quality, and a specified regulatory period (s 53M). Nevertheless, default, customised (and individual) price-quality paths under Part 4 differ markedly in the way in which maximum revenues (or prices) under the price path can be set, which in turn has an effect on the returns that will be achieved by regulated suppliers.
- 2.7.7 The most restrictions on the Commission are in respect of determining DPPs, where there are specific restrictions on setting starting prices (s 53P(3)-(4) and (10)) and rates of change (s 53P(5)-(10)). In contrast, the Commission “may determine any CPP that the Commission considers appropriate” for a supplier that has made a CPP proposal (s 53V), subject to s 52S(b), and may set an individual price-quality path “using any process, and in any way, it thinks fit”, but must use the IMs that apply to the supply of the relevant services (s 53ZC).
- 2.7.8 The extent to which regulated suppliers are limited in their ability to extract excessive profits—consistent with s 52A(1)(d)—depends on how the maximum prices or revenues permitted under the price-quality path permit actual returns that are consistent with earning normal returns over time. In setting a DPP or a CPP, the intention is to provide the opportunity for regulated suppliers to earn above-normal returns, as an incentive for improved efficiency (including efficient investment) and for innovation—consistent with s 52A(1)(a) and (b).
- 2.7.9 If the price-quality path was to be set in a manner where the regulated supplier did not have any opportunity to make normal returns over the forthcoming regulatory period, s 52A(1)(d) would be satisfied. The other desired objectives in the s 52A purpose statement would typically not, however, be adequately promoted in such a situation. In particular, efficient investment needed to meet consumer demands would be discouraged, which would be detrimental to the long-term benefit of consumers. Consequently, one of the key features of default/customised price-quality regulation is that, where a regulated supplier subject to a DPP expects to receive lower than normal returns over the current regulatory period, due to its business-specific circumstances occurring during that period, it is able to propose a CPP instead.
- 2.7.10 The extent to which the desired outcomes are promoted under a DPP or a CPP will be affected by the different constraints on setting DPPs and CPPs, in light of the s 53K purpose of default/customised price-quality regulation (paragraph 2.3.3). A trade-off arises, because setting a CPP that better reflects the particular circumstances of a regulated supplier than a DPP is likely to come at a cost (paragraph 2.8.26).

Information disclosure regulation

- 2.7.11 Generally speaking, a range of comparative information is available to participants in workably competitive markets. Consumers and suppliers can compare prices and the quality of goods and services. The ability to make these comparisons is an important enabler of competition. In markets with only a single supplier, economic regulation based on information disclosure can partly compensate for the absence of the information revelation process associated with rivalry between firms in workably competitive markets.
- 2.7.12 Information disclosure regulation under Part 4 of the Act is, in the first instance, intended to focus on ensuring that interested parties are able to assess whether the Part 4 Purpose is being met (paragraph 2.3.1); in particular, by helping to reflect the extent to which the objectives in s 52A(1)(a) to (d) are being achieved.
- 2.7.13 Given the Part 4 Purpose, it is clear that the supply of regulated services is likely to be, and is intended to be, influenced by the relevant type of regulation. In this respect, information disclosure regulation not only contributes to the specific purpose set out in s 53A, but it can also promote the s 52A purpose by improving the distribution of existing information between regulated suppliers and interested persons, as well as in some cases expanding the information available to regulated suppliers themselves.
- 2.7.14 Placing information and analysis about the regulated suppliers into the public domain can also provide some of the incentives that are consistent with those in workably competitive markets—for example, by providing:
- sufficient information to consumers and other interested parties, including on the extent to which efficiency gains have been shared with consumers through lower prices or other means (consistent with s 52A(1)(c)). Doing so is likely to enhance consumers' countervailing market power, which may result in excessive profits being limited (consistent with s 52A(1)(d)),¹⁰⁴ and may facilitate consumer engagement with regulated suppliers about the desired level of service quality (consistent with s 52A(1)(b));
 - better information to the owners of regulated suppliers in some cases, for example where information disclosure allows comparisons with suppliers in other geographic areas, this may facilitate more effective governance and helping them identify opportunities for value-enhancing trade in assets used to supply regulated services (i.e. consolidation of businesses), management contracting and so on, thereby promoting incentives for improved efficiency, including efficient investment and innovation (consistent with s 52A(1)(a) and (b)); and
 - potentially increased incentives for the management of regulated suppliers to improve relative and absolute performance, both through the ability of

¹⁰⁴ In economics, countervailing power is often described as purchasers' ability to exert a substantial influence on the price, quality or terms of supply of the relevant good or service. A purchaser is able to credibly exert such countervailing power if it is large in relation to suppliers, well informed about alternative sources of supply, readily able to switch from one supplier to another, and able to foster new entry. Consequently, in workably competitive markets, consumers can themselves act as a constraint on market power (paragraphs 2.5.15-2.5.17 above).

interested parties to make comparisons and the public nature of the performance measures, similarly promoting incentives for improved efficiency, consistent with s 52A(1)(a) and (b).

2.8 Relationship of IMs to Regulatory Instruments

Relevance of IMs listed in s 52T

- 2.8.1 In the context of information disclosure regulation, the matters covered by IMs in s 52T(1)(a)—with the exception of some matters listed in s 52T(1)(a)(iii)—are most relevant to the disclosure of financial performance measures, as well as the financial statements and other information that supports those measures (s 53C(2)). In this respect, the key financial performance measure is ‘*return on investment*’ (ROI), which is dependent on actual *revenue* received from the supply of regulated services (paragraphs 2.8.29-2.8.33).
- 2.8.2 In the context of price-quality regulation, the matters in s 52T(1)(a) are most relevant to the setting of maximum *revenue*, either at the beginning of, and possibly for each future year of, the regulatory period (as is discussed in the next subsection). In addition, IMs covering matters specifically relating to CPP proposals (i.e. s 52T(1)(d)) are also likely to have a significant effect on maximum revenues.¹⁰⁵ Consequently, under both information disclosure regulation and price-quality regulation, the actual or future revenue received from the supply of regulated services is the key factor affected by IMs.
- 2.8.3 The matters covered by IMs in s 52T(1)(b)—i.e. pricing methodologies—and in parts of s 52T(1)(a)(iii), relate to the way in which prices for individual services, classes of services, or for different customer groups are set once the overall level of revenue has been determined (as is discussed at paragraphs 2.8.34-2.8.35 below).
- 2.8.4 Section 52T(1)(c), which relates to regulatory processes and rules, sets out only two examples of what these processes and rules might relate to, namely: the specification and determination of prices (including pass-through costs), which could potentially relate to any regulatory instrument; and the identification of circumstances in which price-quality paths may be reconsidered under price-quality regulation. These matters are discussed in Chapter 8.

‘Building blocks’ and price-quality regulation

- 2.8.5 The matters referred to in s 52T(1)(a) relate to a number of the key components generally included in the ‘building blocks approach’ to determining or assessing the revenues received from the supply of regulated services. Regulators in overseas jurisdictions—such as Australia and the UK—typically employ building blocks analysis to assist in setting regulated price or revenue caps when implementing CPI-X incentive regulation.¹⁰⁶ Each building block relates to a different type of cost facing a regulated supplier, and regulators aim to provide firms with an opportunity to recover an efficient level of these costs, including the cost of capital, over the forthcoming regulatory period.

¹⁰⁵ Nevertheless, as is noted in Chapter 9, there may be occasions when a CPP proposal is only related to proposed changes in quality standards.

¹⁰⁶ For an overview of the Australian and UK experience with building blocks, refer: Diewert et al. *supra* n 100, pp. 48-55.

- 2.8.6 Appropriately assessing the overall level of revenue required to generate a normal return on investment is a significant step in promoting outcomes that are consistent with those that would be produced in workably competitive markets. Regulators often seek to achieve this by directly estimating the efficient costs faced by a regulated supplier in providing regulated services (for the level of quality demanded by customers). If these costs are not appropriately assessed by regulators, then over time the prices a regulated supplier is authorised to charge will be too high or too low, on average, relative to the supplier's operating and capital costs. As a result, actual returns would not be consistent with normal returns over time (except where unforecast events generated this result). However, as in workably competitive markets, a regulated supplier that achieves superior performance by reducing actual costs below the forecast costs provided for in the price-quality path will benefit from above-normal returns.
- 2.8.7 With this in mind, the building block approach is generally implemented to be consistent with regulated suppliers earning a normal return, applied on an *ex ante* basis. On an *ex post* basis, however, superior performers will have achieved an actual ROI greater than a normal return. Application of the building blocks approach assists with specifying price-quality regulation for discrete regulatory periods, recognising that the overall objective is to provide the opportunity for normal returns to be earned over time frames that span more than a single regulatory period.
- 2.8.8 In many cases, regulators set allowable revenues to recover forecast costs over regulatory periods of about five years (although longer-term statements of investment requirements are sometimes provided by the supplier to provide an appropriate context for the five-year forecasts). This is because these assessments require forecasts of relevant parameters such as capital and operating expenditure, which are difficult to forecast with accuracy far into the future. On the other hand, if regulatory periods are too short, incentives for improved efficiency may be weakened and there may be less certainty for making investment decisions in long-lived infrastructural assets.

Key components of building blocks

- 2.8.9 The building blocks approach involves determining allowable revenues that are expected to recover the following 'building block' cost components faced by the regulated supplier, namely:
- non-capital costs (e.g. operating expenditure and tax); and
 - capital costs, comprising:
 - a 'return on' efficiently invested capital recognised for regulatory purposes, termed the regulatory asset base (RAB)—the value of which is updated each year for depreciation and efficient capital expenditure—multiplied by the cost of capital); and
 - a 'return of' efficiently invested capital (i.e. by allowing recovery of the depreciation in the value of the RAB).

2.8.10 A general expression for the annual building blocks allowable revenue for a regulated supplier can be represented as follows:

$$\begin{aligned} & \text{Regulatory Asset Base} \times \text{Cost of Capital} + \text{Depreciation} + \text{Operating Expenditure} + \text{Tax} \\ & - \text{Revaluation Gains (or} + \text{Revaluation Losses)} - \text{Other income}^{107} \\ & = \text{Building Blocks Allowable Revenue} \end{aligned}$$

2.8.11 The value of the RAB at the end of each year is generally determined—or ‘rolled forward’—as follows:

$$\text{RAB (end of year)} = \text{RAB (beginning of year)} - \text{Depreciation} + \text{Revaluations} + \text{Capital Additions} - \text{Capital Disposals}$$

2.8.12 For example, the Australian Competition and Consumer Commission (ACCC) explains that:

The building block model consists of two equations which are known as the revenue equation and the asset base roll forward equation. These two equations are used to determine an allowed stream of revenues for each [transmission network service provider] for as long as it remains regulated. Ignoring any incentive rewards or penalties, these equations together ensure that the present value of the allowed revenue stream is equal to the present value of the expenditure stream of the regulated firm.¹⁰⁸

2.8.13 Each building block cost component is generally intended to reflect realistically achievable efficiencies for the particular component in question. Nevertheless, a more important consideration is to ensure that appropriate incentives for efficiency are provided by the application of the building blocks approach as a whole (i.e. in setting a price path for an entire regulatory period), rather than by any individual building block component. There are usually uncertainties involved in estimating each component. Consequently, regulators typically set each component mindful of the asymmetric consequences of achieving a return that is too low, which might discourage investment, versus a return that is too high, which might result in excessive profits. Although lower prices will generally provide immediate benefits to consumers, consumers will only benefit in the long-term if regulated suppliers have incentives to make efficient investments such that regulated services can be provided at a quality that reflects consumer demands.

¹⁰⁷ Building blocks allowed revenue generally relates to income received from standard line (or pipeline) charges. ‘Other income’ typically relates to income associated with the provision of regulated services that is recovered in a different manner from line charges.

¹⁰⁸ ACCC, *Statement of principles for the regulation of electricity transmission revenues – background paper*, 2004, p. 21. Application of the building blocks approach in the UK is described in: Ofgem, *Regulating energy networks for the future: RPI-X@20: History of energy network regulation*, 2009. The equivalence of the present value of revenues and present value of costs referred to in the ACCC quote, is often referred to by the term ‘NPV=0’, which recognises that if this equivalence holds, then the *net* present value (NPV) of the revenues less the costs is zero. The term NPV=0 is used throughout earlier consultation documents and submissions on Part 4.

‘Present value’ is the value on a given date of a future payment or series of future payments, ‘discounted’ to reflect the time value of money. The time value of money is based on the premise that an investor prefers to receive a payment of a fixed amount of money today, rather than an equal amount in the future, all else being equal. This is because, if one received the payment today, one could then earn a return on the money until that specified future date. Hence, the present value of a future cost/benefit is the value of that cost/benefit discounted back to the present, by taking into account the compounded cost of capital. For example, if the cost of capital is 10%, the present value of receiving \$100 in one year’s time is \$90.91 (found by dividing the \$100 by 100%+10%). In two years’ time, the present value of receiving \$100 is \$82.64 (found by dividing the \$90.91 amount by 100%+10%).

Revaluation gains and losses

- 2.8.14 As noted above (paragraph 2.6.28), FCM requires that regulated suppliers are compensated for the impact of economy-wide inflation over time. Where a nominal cost of capital is used, the value of any existing asset in the RAB does not need to be revalued to reflect changes in economy-wide inflation for the supplier's financial capital to be maintained in real terms. Alternatively, however, regulated suppliers can also be compensated for inflation by applying a cost of capital calculated in real terms and by indexing the value of the RAB by the CPI. The two approaches are equivalent in present value terms when assessed over the lifetime of the assets.¹⁰⁹
- 2.8.15 To set regulated revenues based on a RAB value indexed to the CPI with a nominal cost of capital would be to double-count the effect of inflation. Hence, if a nominal cost of capital is applied to an inflated/indexed asset base, any revaluations of the asset, such as an upward revaluation for inflation, must be treated as income—on the one hand to maintain the value of the investment and, on the other, to prevent the business from obtaining compensation for inflation twice.¹¹⁰
- 2.8.16 The same principle applies, however, even where a revaluation occurs for reasons other than economy-wide inflation, and where the extent of the revaluation differs from the change in the CPI.¹¹¹ Because the use of a nominal WACC with a non-revalued asset base is consistent with FCM, any revaluation gain must be treated as income.¹¹²
- ... the precise way in which asset revaluations are incorporated into the price-setting process over time is less important than the fundamental principle that upward changes in asset values represent a form of income to the provider of infrastructure services and so need to be netted off from revenue that is to be recovered from charges for the use of those assets.¹¹³
- 2.8.17 Hence, where regulators are attempting to limit a regulated supplier's profits to close to a normal return, revaluation gains (and losses) will need to be taken into account for consistency with FCM. This is why the revaluation gains (or losses) that are in the roll forward equation (paragraph 2.8.11) are netted off (or added to) the building blocks allowable revenue (paragraph 2.8.10). Doing so is consistent with a workably competitive market, in which returns are provided by both income and growth (i.e. capital gains). Capital gains themselves reflect an expectation of higher cash flows in the future, either through expected cash flows from revenue generated by employing assets to supply services, and/or through the sale of those assets.
- 2.8.18 Maintaining FCM in this manner will provide incentives for investment, consistent with s 52A(1)(a), while limiting excessive profits, consistent with s 52A(1)(d). Nevertheless, it is important to reiterate that, in the context of price-quality regulation, FCM is applied on an *ex ante* basis. Allowing regulated suppliers the

¹⁰⁹ For example: The Treasury, *Estimating the Cost of Capital for Crown Entities and State-Owned Enterprises*, Wellington, October 1997, pp. 67-72.

¹¹⁰ For example: IPART, *Weighted Average Cost of Capital*, Discussion Paper DP 56, Sydney, August 2002, p. 6.

¹¹¹ Shuttleworth, *supra* n 95, pp. ii and 13-15.

¹¹² For example: NERA, *Comment on the Commission's Valuation Choice Discussion Paper*, Report prepared for Orion, Sydney, February 2005, p. 9.

¹¹³ NERA, *Effectiveness of the Regulation of Airport Services*, Report for Qantas, Sydney, July 2006, p. 44.

opportunity to achieve a higher levels of profits over the short to medium term as a reward for efficiency gains, provides the incentives for those gains to be made in the first place, consistent with s 52A(1)(b). Those efficiency gains are then shared with consumers, consistent with s 52A(1)(c), when the price path is reset at the end of each regulatory period (paragraphs 2.7.3-2.7.4).

Building blocks and price/revenue paths

- 2.8.19 Part 4 provides the Commission with a number of options for ‘capping’ revenues or prices under price-quality regulation. Section 53M(1) allows price-quality paths to be specified in terms of maximum revenues and/or prices, and the definition of ‘price’ (in s 52C) itself means any one or more of individual prices, aggregate prices, or revenues (whether in the form of specific numbers or in the form of formulae by which specific numbers are derived). The most common form of price cap is a CPI-X ‘weighted average price path’, where prices are weighted by associated quantities.¹¹⁴ The regulated supplier’s weighed average prices in any one year must not exceed the weighted average prices in the previous year, indexed by the CPI minus the X factor. Such a price cap acts to constrain overall revenues rather than individual price levels, and the regulated supplier is free to set individual prices to different consumer classes (i.e. consumer groups) and/or different geographic areas consistent with the weighted average price cap.
- 2.8.20 Depending on what form of price or revenue cap is to be applied, the building block allowable revenues are transformed into a CPI-X price path or CPI-X revenue path. This is typically achieved by ‘smoothing’ building blocks allowable revenue over the entire regulatory period, in a present value-equivalent manner, such that the same X-factor applies in each year of the regulatory period. The level of average starting prices will depend of the rate of change in average prices over the period that is itself dependent on the selected X factor.

Building blocks and IMs under default/customised price-quality regulation

- 2.8.21 With the exception of matters covered in s 52T(1)(a)(iii), which relate to the allocation of common costs, the key matters in s 52T(1)(a)—i.e. cost of capital, asset valuation, revaluations, depreciation, and tax—are directly relevant to either or both of the building blocks and asset valuation roll-forward formulae set out above. The Commission’s IMs for asset valuation, revaluations, and depreciation are discussed in Chapter 4. The IMs for the treatment of taxation and the cost of capital are discussed in Chapters 5 and 6 respectively.
- 2.8.22 In applying the building blocks approach, asset values, capital additions, and operating expenditure all need to be appropriately allocated in respect of the services that cause them. In particular, regulated suppliers may supply different types of regulated services (i.e. electricity distribution, gas distribution and/or gas transmission services), as well as some unregulated services (e.g. electrical contracting or telecommunications services), resulting in costs that are shared between, or ‘common’ to, one or more of those different types of services (i.e. the

¹¹⁴ To provide a simple example, if five units of one service are sold at \$1 per unit, and ten units of another service are sold at \$1.50 per unit, then the weighted average price is \$1.33 (i.e. $[(5 \times \$1) + (10 \times \$1.50)] / [5 + 10]$). In practice, electricity and gas are sold with prices specified in terms of a number of different types of measurement units, such as per kWh, per kVA, per MW and per customer, which makes the weighted average price path formula somewhat more complex than in this simple example.

‘common costs’ referred to in s 52T(1)(a)(iii)). The Commission’s IM for allocating costs between different types of services is discussed in Chapter 3.

- 2.8.23 A regulated supplier may propose a CPP to meet its particular circumstances better than a DPP. In this respect, the building blocks approach for determining allowable revenue is well-suited to determining the average starting prices and rate of change of a price path based on forecast supplier-specific costs over the coming regulatory period.
- 2.8.24 By contrast, there are significant constraints on setting both starting prices and rates of change for a DPP (s 53P). Notably, the rate of change must—subject to s 53P(8)—be the same for all suppliers of a particular type of regulated service, and be “based on the long run average productivity improvement rate achieved by either or both of suppliers in New Zealand, and suppliers in other comparable countries, of the relevant goods or services, using whatever measures of productivity the Commission considers appropriate” (s 53P(6)).
- 2.8.25 Productivity-based approaches to setting price paths are typically much less intrusive and data-intensive than building block approaches, and therefore tend to be less costly. Consequently, using a productivity-based approach to determine DPPs is a key part of tailoring the Part 4 regime to New Zealand’s small size, with small suppliers and limited resources (paragraph 1.2.19). However, some regulated suppliers may be disadvantaged by an approach that is based on industry-wide factors, unless supplier-specific factors are explicitly allowed for in the analysis.
- 2.8.26 For example, productivity-based price paths can disadvantage firms that face comparatively more adverse cost conditions than other firms, due to business-specific environmental (or other) factors largely outside management’s control. Consequently, under Part 4, CPPs are provided for in situations where supplier-specific circumstances differ from those implied by a DPP that is heavily influenced by industry-wide factors. The trade-off is that determining a CPP is likely to be more costly than determining a DPP. However, if the Commission receives more than four CPP proposals for the same type of regulated service in any one year, the Commission must prioritise those proposals, and may defer consideration of the additional proposals until a subsequent year (s 53Z).
- 2.8.27 Some supplier-specific factors can be taken into account in determining a DPP, as starting prices must be based on the current and projected profitability of each supplier (unless the prices at the end of the preceding regulatory period apply). Using a combination of industry-wide and supplier-specific data to derive price paths for individual suppliers is sometimes referred to as a ‘partial’ building blocks approach because, while the X-factor is set using some form of industry-wide (or peer group) productivity analysis, the prices at the beginning of the regulatory period are set using a form of building blocks. Under Part 4, the use of peer group analysis is, however, precluded by s 53P(10).
- 2.8.28 The Commission is still consulting on how to set starting prices for the existing DPPs applying to EDBs (pursuant to s 54K(3)) and for the first DPPs that will apply to GPBs. The Commission has proposed assessing the current and projected profitability of each supplier by comparing each supplier’s ROI against the relevant

cost of capital estimate.¹¹⁵ However, as noted in the next subsection, given that ROI indicators are likely to derive from information disclosure regulation (or from responses to s 53ZD notices, prior to the first information disclosure determinations being made), the relationship between IMs and DPPs will be an indirect one.

Building blocks and IMs under information disclosure

2.8.29 Measuring returns is an important aspect of assessing whether excessive profits are being limited, and whether financial capital is being maintained, and therefore assists interested parties to assess whether the Part 4 Purpose is being met.

2.8.30 On an annual basis, and in simplified form, the ROI for that part of a regulated supplier providing a particular type of regulated service can be calculated as follows.

$$ROI = \frac{\text{Revenue} - \text{Depreciation} - \text{Opex} - \text{Tax} + \text{Revaluations}}{\text{Regulatory Asset Base}}$$

2.8.31 The actual specification of the ROI will be in the relevant information disclosure determination (made under s 52P). As is the case with determining maximum allowable revenue under price-quality regulation, under information disclosure regulation, asset values, capital additions, and operating expenditure (i.e. opex) all need to be appropriately allocated to the particular type of regulated service to which they relate. If the ROI is calculated in this way it may be compared to the cost of capital applicable to supplying the type of regulated service in question, provided both the ROI and the cost of capital are calculated on a consistent basis (e.g. both in post-tax terms).¹¹⁶

2.8.32 Where the ROI is consistently higher than the cost of capital, this may imply that excessive profits are not appropriately limited in their ability to extract excessive profits (i.e. s 52A(1)(d)). The ROI equation is effectively the same as the equation for revenue above (paragraph 2.8.10) after that equation is rearranged in terms of the cost of capital, and then expressed in terms of the ROI (given the ROI and the cost of capital are intended to be comparable). Consequently, the IMs discussed in Chapters 3 - 6 are relevant to both information disclosure regulation and default/customised price-quality regulation.

2.8.33 Under s 53F(1)(b), regulated suppliers that are subject to only information disclosure regulation (i.e. airports and consumer-owned EDBs) do not have to apply any methodologies for evaluating or determining the cost of capital set in accordance

¹¹⁵ Commerce Commission, *Starting Price Adjustments for Default Price-Quality Paths Discussion Paper*, 5 August 2010.

¹¹⁶ Economic returns comparable to the cost of capital differ from publicly available assessments of accounting profitability, such as those found in statutory financial accounts. Any annual accounting-based estimate of returns such as the ROI can only ever be an approximation to measures of the economic returns of an investment over time, such as the internal rate of return (IRR). Any analysis of the profitability of regulated suppliers will almost inevitably be over a time period shorter than the economic lifetimes of the assets involved, and will have to primarily rely on accounting-based rather than economic-based data (particularly in respect of asset values). As a result, the differences between accounting-based measures of profitability and the economic IRR will differ significantly where there are substantial fluctuations in the underlying asset values during the period of assessment—especially if that period is only a single year. Consequently, by being able to take a longer term view, the Commission's published summary and analysis of disclosed information under s 53B(2) will play an important role. The Commission will be able to analyse the changes in disclosed ROIs over time, in light of changes in relevant disclosures relating to efficiency, in order to assist interested parties in assessing whether excessive profits are being limited, and whether financial capital is being maintained.

with s 52T(1)(a)(i). The reason for this provision is evident from the ROI formula above, in which the cost of capital does not appear. The cost of capital is only relevant in this context for comparative purposes. Consequently, under s 53F(2), the Commission may use methodologies for evaluating or determining the cost of capital to monitor and analyse disclosed information under s 53B(2), but doing so is not mandatory.

Pricing methodologies and related cost allocation methodologies

- 2.8.34 Some of the matters set out in s 52T(1)(a)(iii)—such as those relating to the allocation of common costs between consumer classes and geographic areas—relate to the allocation of costs between services of the same type. These matters are applicable to setting *prices* for that type of regulated service, rather than the overall *revenue* that can be recovered in respect of that type of service.¹¹⁷ Therefore, these matters in s 52T(1)(a)(iii) are relevant to the IMs to be set for pricing methodologies under s 52T(1)(b).
- 2.8.35 The Electricity Industry Act 2010 has amended s 52T(1)(b) so that the Commission does not need to set IMs for pricing methodologies “where another industry regulator (such as the Electricity Authority) has the power to set pricing methodologies in relation to particular goods or services”. ENA argues that the Commission should still set a pricing methodology.¹¹⁸ On the other hand, Orion submitted that inconsistencies between the regulatory regimes might lead to considerable uncertainties for EDBs, EDBs not being to recover their costs, and/or price shocks to consumers.¹¹⁹
- 2.8.36 Given the responsibilities that the Electricity Authority has in respect of pricing methodologies for EDBs (and Transpower), and to ensure no overlap of the Commission’s role with the Authority, the Commission has decided to set an IM for pricing methodologies for GPBs, but not for EDBs (or Transpower). The Commission’s IM for pricing methodologies for GPBs is discussed in Chapter 7.

Relevance of particular IMs to the regulatory objectives

- 2.8.37 IMs provide a number of the key ‘inputs’ to information disclosure regulation and price-quality regulation. Relevant IMs in s 52T(1)(a) combine with each other in the relevant s 52P determination to determine what is to be disclosed as ROIs under information disclosure regulation, or to determine maximum allowable revenue under price-quality regulation. Therefore, as noted above (paragraph 2.4.16), it is in combination with each other, and with other requirements in a s 52P determination, that IMs provide the strongest incentives for regulated suppliers to act in a manner consistent with the s 52A purpose statement.
- 2.8.38 Nevertheless, although each relevant IM is only part of a wider package, some types of IMs are more relevant to certain regulatory objectives in s 52A(1)(a) to (d) than to others. In particular:

¹¹⁷ This is consistent with the definition of pricing methodologies in s 52C, which includes methodologies for setting different prices for different customer groups.

¹¹⁸ ENA, *Submission 4 Pricing Methodologies and Input Methodology*, 9 August 2010, paragraph 12.

¹¹⁹ Orion, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 5-6, paragraphs 8.14-8.15; Orion, *Submission on EDBs Revised Input Methodologies Draft Determination*, 11 November 2010, p. 7, paragraph 21.

- the way that costs are allocated between regulated and/or unregulated services has an important bearing on how efficiency gains are shared with consumers over time, which is relevant to s 52A(1)(c), as well as on the extent to which investment by regulated suppliers in the provision of other services is unduly deterred (i.e. s 52T(3) and s 52A(1)(a))—refer Chapter 3;¹²⁰
- the way that the value of the RAB is rolled forward affects how regulated suppliers recover the investments that they make, which in turn significantly affects the incentives to invest that they face, consistent with s 52A(1)(a) and (b)—refer Chapter 4;
- the level of the ‘initial’ value of RAB (i.e. at the beginning of the Part 4 regime), is far less significant to incentives for investment or efficiency than the way that the value of the RAB is rolled forward, but it has a notable bearing on whether regulated suppliers are limited in their ability to extract excessive profits from consumers in future, which is relevant to s 52A(1)(d) —refer Chapter 4;
- the treatment of tax also has an impact on whether regulated suppliers are limited in their ability to extract excessive profits from consumers in future, which is relevant to s 52A(1)(d) —refer Chapter 5;
- the cost of capital will have an impact on monitoring whether financial capital is being maintained, which is relevant to both s 52A(1)(a), and whether regulated suppliers are limited in their ability to extract excessive profits, which is relevant to s 52A(1)(d)—refer Chapter 6; and
- pricing methodologies primarily have a bearing on allocative efficiency (paragraph 2.6.28), and are therefore particularly relevant to s 52A(1)(b)—refer Chapter 7.

Additional matters for inclusion in IMs

2.8.39 A number of regulated suppliers have argued strongly that the approach to setting starting prices for DPPs (and possibly the approach to setting rates of change and quality standards as well) ought to be set out in an IM.¹²¹ Various arguments have been raised in favour of this position, including that starting price adjustments are a pricing methodology under s 52T(1)(b) and/or a rule and process under 52T(1)(c), as well as that starting price adjustments must be included in an IM determination to satisfy the provisions in s 52T(2). A number of submitters also argue that rules on rates of change and quality standards should also be part of an IM determination.¹²²

2.8.40 Although the list of methodologies, processes, rules, or matters in s 52T(1) is not limiting, and the Commission may specify IMs on other matters, the Commission does not consider that it is necessary or appropriate to set out the approach to setting

¹²⁰ “Other services” refers to other goods or services, and unregulated services refers to unregulated goods or services, for the purposes of this Paper.

¹²¹ For example: Powerco, *Submission 1 in response to draft IM and ID determinations*, 9 August 2010, paragraph 88.

¹²² For example, ENA, *Starting Price Adjustment Methodology*, Letter to Dr Mark Berry, 23 July 2010.

starting prices (or the approach to determining rates of change and quality standards) in an IM.¹²³

- Starting price adjustments do not fall within the definition of pricing methodologies under s 52T(1)(b). Starting price adjustments relate to allowable revenue under a revenue cap or a weighted-average price cap at the beginning of a regulatory period, rather than to constraints on pricing methodologies. Pricing methodologies are very different. They relate to how the maximum allowable revenue is recovered from particular classes of consumers (potentially in different geographic areas). Constraints on individual prices through pricing methodologies are a separate type of regulatory intervention. Responsibility for setting revenue requirements (such as starting price adjustments and X factors) is vested in one body (i.e. the Commission). Responsibility for setting pricing methodologies can be vested in others (e.g. the Electricity Authority—paragraph 2.8.35).¹²⁴
- Starting price adjustments are not a prescribed IM under s 52T(1)(c). They are governed under other provisions within Part 4. Those provisions would be redundant if starting price adjustments were an IM. For example, starting prices are explicitly referred to under s 53O and s 53P, not s 52T. Unlike the matters listed in s 52T, s 53P includes a range of specific provisions constraining how starting prices (and rates of change) may be determined. Parliament’s Commerce Committee, when considering the Part 4 amendments, considered a range of additional proposals for inclusion in s 52T. It rejected submissions from ENA and others that starting price adjustments and other matters should be listed in s 52T(1)).

We did not agree with submitters who put forward a range of proposals for additional matters to be covered by input methodologies in new section 52S [now section 52T]. Given that the Commission is already faced with a very large and demanding workload we consider that additional requirements would put pressure on the input methodology process.¹²⁵

- As an alternative, some submitters argued that the approach for starting price adjustments should be included within existing IMs, and that failure to do so would result in the IMs not complying with the requirements of s 52T(2). Section 52T(2) requires each IM to contain sufficient detail for suppliers to be reasonably able to estimate the material effects of the IM on it. The submitters’ interpretation would defeat the Commerce Committee’s clear decision not to require the Commission to set the approach to starting price adjustments as part of the IM process. If s 52T(2) required the Commission to specify the approach for starting price adjustments in IMs, there would be no need, for

¹²³ Commerce Commission, *Re: Starting Price Adjustments*, Letter from Dr Mark Berry to Alan Jenkins (ENA), 30 July 2010.

¹²⁴ For instance, Vector has acknowledged this: “Given the interaction between the Electricity Industry Bill and the Commerce Act 1986 in relation to the definition of “pricing methodologies”, Vector considers the input methodology for DPP starting prices is more appropriately a requirement under the rules and processes input methodologies rather than pricing methodologies” (Vector, *Submission to Commerce Commission on Starting Price Adjustments for DPPs*, 10 September 2010, p. 15).

¹²⁵ Commerce Committee, *supra* n 58, p. 4. Also refer: associated prior submissions from interested parties, including ENA, and subsequent advice from MED to the Commerce Committee (www.parliament.nz).

example, to consult on resetting DPP starting prices (or rates of change and quality standards) as is required under s 53P(2).

- 2.8.41 Moreover, there are benefits of not including the approach for starting price adjustments in an IM. The approach for starting price adjustments is best developed in an iterative process in which account can be taken of feedback and comment from the regulated suppliers and from other interested parties. Part 4 contemplates determining starting price adjustments, as well as rates of change and quality standards, in this iterative manner, given that none of these matters are set out in s 52T and consultation is required under s 53P.
- 2.8.42 Setting out an overly mechanistic approach to starting price adjustments in an IM could unnecessarily limit the ability of the Commission to take into account various factors raised through such feedback. For instance, regulated suppliers have, during consultation on starting price adjustments to date, raised a range of factors which they urge the Commission to consider as part of adjusting starting prices.¹²⁶ It would be difficult to provide for all the factors that might be relevant as part of an upfront IM.

2.9 Other Statutory Considerations

- 2.9.1 In setting IMs for EDBs and GPBs, the Commission has also taken into account other considerations, including:
- a. obligations relating to energy efficiency provided for under s 54Q of the Act;
 - b. decisions under the Electricity Industry Act 2010, as required under s 54V of the Act;
 - c. decisions under the Gas Act 1992, as required under s 55I of the Act; and
 - d. the Gas Authorisation.
- 2.9.2 Apart from the Gas Authorisation, the Commission has also had regard to other aspects of the previous regulatory regimes that applied to EDBs and GPBs (refer Chapter 1), to the extent applicable to regulation under Part 4. This includes the transitional provisions in Part 4 that maintain a number of pre-existing regulatory provisions in force (paragraph 1.2.18).

Energy efficiency

- 2.9.3 Section 54Q requires that the Commission, when applying regulation under Part 4, must promote incentives, and avoid imposing disincentives, for suppliers of electricity lines services to invest in energy efficiency and demand-side management and to reduce energy losses. “Energy efficiency” refers to both demand side management and energy loss reduction.
- 2.9.4 The requirements set out in section 54Q apply to the effect of Part 4 regulation as a whole. As such, the Commission considers that the requirements under section 54Q

¹²⁶ For example: Vector, *Submission to Commerce Commission on Starting Price Adjustments for DPPs*, 10 September 2010, paragraphs 60-64.

are to be met through the combined application of the regulatory instruments under Part 4 that apply to suppliers of electricity lines services.

- 2.9.5 The Commission is satisfied that the IMs, when applied through the regulatory instruments, will not impose disincentives on suppliers to invest in energy efficiency. The Commission is also considering how to more directly promote investment in energy efficiency under the DPP.

Electricity Industry Act

- 2.9.6 Section 54V sets out provisions relating to the interface with the Electricity Industry Act 2010. It specifies matters which the Commission must take into account. The Commission has considered its obligations under section 54V when making its decisions on IMs for electricity lines services.

Gas Act

- 2.9.7 Section 55I sets out provisions relating to the interface with the Gas Act 1992. It specifies matters which the Commission must take into account. The Commission has not to date received any communication from the Gas Industry Co. Ltd ('GIC') (i.e. the industry body established by Order-in-Council under s 43ZL of the Gas Act), under s 55I of the Act.

Gas Authorisation

- 2.9.8 Under s 55G(2) of the Act, the Commerce (Control of Natural Gas Services) Order 2005 (Order) continues in force, despite the repeal of Part 4 (as it was before its repeal by the CAA), until the date on which the Order expires or is revoked. Section 55G(3) confirms that the enactment of the new Part 4 does not limit or affect, before the expiry date, the Commerce Commission Authorisation (Decision Nos. 656 and 657), authorising the supply of controlled gas distribution services defined by the Order (i.e. gas distribution services) that are supplied by Powerco Ltd and Vector Ltd respectively. The Authorisation is due to expire on 1 July 2012. As such, the IMs relevant to default/customised price-quality regulation for gas pipeline services do not apply to those services until that date. In the case of Vector, the gas pipeline services supplied under the Authorisation are referred to in this Paper as 'Vector (Auckland)'. IMs for gas pipeline services that are applicable to information disclosure regulation under Part 4 will apply to those services when the Commission sets that regulation.

CHAPTER 3: COST ALLOCATION

3.1 Introduction

IM for allocating costs

- 3.1.1 Section 52T(1)(a)(iii) of the Act requires that the IMs relating to a particular regulated service must include, to the extent applicable to the type of regulation under consideration, an IM for the “allocation of common costs, including between activities, businesses, consumer classes, and geographic areas”.
- 3.1.2 The term ‘common costs’ is undefined in the Act and has a number of possible meanings (including a specific meaning applied by some economists). It can also be measured in a number of ways, as is explained later in this chapter. The Commission has therefore used the more general term ‘shared costs’ in most contexts, when referring to costs that are common to two or more types of services.
- 3.1.3 This chapter describes the IM for the allocation of costs between electricity distribution services, gas distribution services, gas transmission services and any unregulated services provided by the same supplier. It also explains how the IM allocates common costs as required by s 52T(1)(a)(iii) and is appropriate under Part 4.¹²⁷ In particular, the IM ensures that efficiency gains arising from the joint supply of different types of services are shared between suppliers and consumers.
- 3.1.4 EDBs provide regulated electricity distribution services and GPBs provide gas distribution and/or transmission services. Many suppliers also provide unregulated services. Some suppliers provide two or three types of regulated services. For instance, Vector supplies three types of regulated services (electricity distribution services, gas distribution services, and gas transmission services) as well as a range of unregulated services (e.g. telecommunications services, utilities training, tree cutting and electricity generation from wind power).
- 3.1.5 The provision of these different types of services by a regulated supplier gives rise to the sharing of operating costs (e.g. expenses related to head office functions) and capital costs through the sharing of assets (e.g. power poles also used to carry telecommunications lines).¹²⁸ The cost allocation IM covers the allocation of shared operating costs and shared asset values (which drive capital costs). Setting an IM that allocates asset values that are shared will therefore also allocate capital costs.
- 3.1.6 As explained in detail in this chapter, the total cost of supplying two or more types of services in combination is often lower than if the same services are provided independently. The resulting cost reductions represent efficiency gains associated with joint supply. To the extent that regulated suppliers benefit from these efficiency

¹²⁷ The Commission considers that referring to the allocation of costs between the relevant ‘services’ is synonymous with referring to the allocation of costs between the ‘activities’ undertaken by the regulated supplier to supply those services, or with referring to the allocation of costs between the ‘businesses’ operated by the regulated supplier that supply those services. The Commission considers the allocation of costs between ‘consumer classes’ and ‘geographic areas’ is more relevant to pricing methodologies (i.e. s 52T(1)(b)) than to the cost allocation IM (i.e. s 52T(1)(a)(iii)).

¹²⁸ Capital costs include both a return of the value of assets (i.e. depreciation) and a return on the value of assets (i.e. a return on investment).

gains (e.g. through higher profitability over the short- to medium-term), they have an incentive to provide multiple services.

Application of the cost allocation IM

- 3.1.7 The cost allocation IM applies to all types of GPBs (distribution and transmission) and EDBs (i.e. exempt and non-exempt).
- 3.1.8 Under price-quality regulation, the extent to which costs are allocated to regulated services may have a material effect on prices for regulated services, given that allowable revenue is set to allow the supplier to recover its costs.
- 3.1.9 When applied as part of DPP/CPD price-quality regulation, the cost allocation IM provides the rules by which EDBs and GPBs must decide what proportion of shared costs should be recovered from consumers of the regulated services they supply.
- 3.1.10 When applied under information disclosure regulation, the cost allocation IM provides the rules that suppliers must adhere to when disclosing their cost data (and other financial information that relies on cost data). These rules are important since the allocation of shared costs can have a significant effect on financial results as represented in regulatory accounts provided under an information disclosure regime, which in turn will affect assessments made by interested persons. Accordingly, the cost allocation methodology standardises the way the allocations of shared costs are reported, which in turn facilitates consistent assessment of performance over time and between regulated suppliers.

Overview of the IM and structure of this chapter

- 3.1.11 Table 3.1 provides an overview of the cost allocation IM. Its key components are discussed in this chapter and Appendices B to C.

Table 3.1 Overview of Cost Allocation IM

Description	Reference
If a cost is solely and wholly caused by a single type of regulated service the cost is ‘directly attributable’ and is allocated solely to that type of service.	Section 3.3
EDBs and GPBs must apply one of three complementary approaches to allocate costs that are ‘not directly attributable’ between each type of regulated service, and between the regulated and unregulated services (in aggregate) they provide: <ul style="list-style-type: none"> • the accounting-based allocation approach (ABAA); • the optional variation to the accounting based approach (OVBA); and • avoidable cost allocation methodology (ACAM). 	Section 3.3; Appendix B, Sections B4 to B6
The IM specifies the process for deciding which of the three approaches suppliers must use to allocate shared costs in different circumstances.	Appendix B, Sections B2 and B3

Description	Reference
Under the ABAA, where possible, cost and asset allocators used to allocate costs to regulated activities must be based on current ‘causal relationships’. Where this is not possible, proxy allocators must be used instead.	Section 3.3
<p>‘Causal relationships’ are defined in relation to:</p> <ul style="list-style-type: none"> • asset values, as a circumstance in which a factor influences the utilisation of an asset during the 18 month period terminating on the last day of the disclosure year in respect of which the allocation is carried out; and • operating costs, as a circumstance in which a cost driver leads to an operating cost being incurred during the 18 month period terminating on the last day of the disclosure year in respect of which the allocation is carried out. 	Appendix B, Section B4
Suppliers may also clarify their cost allocation policy more directly (than through the use of the three approaches) through their own operational practices. Where this is the case, the IM allows suppliers to make voluntary deductions for operating costs and asset values that have been recovered in arm’s-length transactions.	Sections 3.3; Appendix B, Section B7

3.1.12 In addition to applying the cost allocation IM, EDBs and GPBs need to disclose how they allocate costs (see Sections 3.3, B8 and Appendix D). EDBs and GPBs may also need to provide additional supporting information directly to the Commission.

3.1.13 The remainder of this chapter is structured as follows:

- Section 3.2 discusses the:
 - key considerations the Commission has had regard to in setting the IM;
 - economic and accounting cost concepts that the Commission considers need to be defined in order to set the IM;
 - relevant EDB and GPB sector context; and
 - insights from workably competitive markets relevant to the IM, particularly in relation to incentives for efficiency, sharing of efficiency gains and incentives for investment.
- Section 3.3 sets out how costs are required to be allocated under the IM.

3.1.14 Further supporting technical information on the components and the application of the IM is provided in Appendices B to D.

3.2 Key Considerations in Determining the Cost Allocation IM

Statutory requirements

3.2.1 The Commission has considered the Part 4 Purpose and examined the insights the phrase ‘promoting outcomes consistent with outcomes produced in workably competitive markets’ provides for the cost allocation IM for EDBs and GPBs. It has

then considered whether, and if so how, each of the regulatory objectives in s 52A(1)(a)-(d) are relevant to allocating costs between different types of regulated services, and between regulated and unregulated services (in aggregate), and whether they provide any practical constraints on the form of the cost allocation methodology to be used as part of this IM.

3.2.2 In particular, the Commission has considered:

- Section 52A(1)(b), which requires that incentives for suppliers to improve efficiency must be promoted. The way in which these incentives arise is discussed in paragraphs 3.2.36 to 3.2.38;¹²⁹
- Section 52A(1)(c), which requires that outcomes promoted must ensure that suppliers share the benefits of efficiency gains in the supply of regulated services with consumers of those services, just as efficiency gains are shared in workably competitive markets between suppliers and consumers. Where costs are shared between the provision of regulated and unregulated services, the associated efficiency gain would not exist were it not for the existence of both the regulated and unregulated services.¹³⁰ The benefits of efficiencies that arise in the joint supply of regulated and unregulated services should be shared with consumers of regulated services. The sharing of the benefits of efficiency gains is discussed in paragraphs 3.2.39 to 3.2.72,¹³¹ and
- Section 52T(3), which requires that the cost allocation IM must not unduly deter investment by a supplier of regulated services in the provision of other services (whether regulated or unregulated). The Commission has kept this provision firmly in mind. Paragraphs 3.2.73 to 3.2.85 assess relevant outcomes in workably competitive markets, discuss the meaning of ‘unduly’ deterring investment and set out the relevant implications for setting the IM.¹³²

3.2.3 The purpose of IMs is to promote certainty for suppliers and consumers in relation to the rules and processes applying to regulation under Part 4 (s 52R). A highly prescriptive IM needs to be balanced against flexibility to take into account differences between suppliers’ businesses in order to bring outcomes closer to those in workably competitive markets. While some flexibility in outcomes is provided by the cost allocation IM, through the choice of different approaches under certain circumstances, the rules and processes for determining the circumstances in which each approach should apply are specified.

3.2.4 This may be seen as reducing certainty for suppliers regarding the level of costs allocated to each type of service. However, suppliers have certainty as to the rules and processes for determining which of the three approaches should apply.

¹²⁹ The existence of these incentives gives rise to efficiencies to be shared (s 52A(1)(c)) and incentives for investment (s 52A(1)(a)).

¹³⁰ The Commission’s focus is on sharing efficiency gains made in the supply of regulated services. Some of these efficiency gains arise as a result of providing regulated and unregulated services in combination. The Commission is not concerned with efficiency gains solely arising in the supply of unregulated services.

¹³¹ The existence of this sharing is also consistent with limiting suppliers’ ability to extract excessive profits under s 52A(1)(d).

¹³² The requirement not to unduly deter investments is also consistent with s 52A(1)(a).

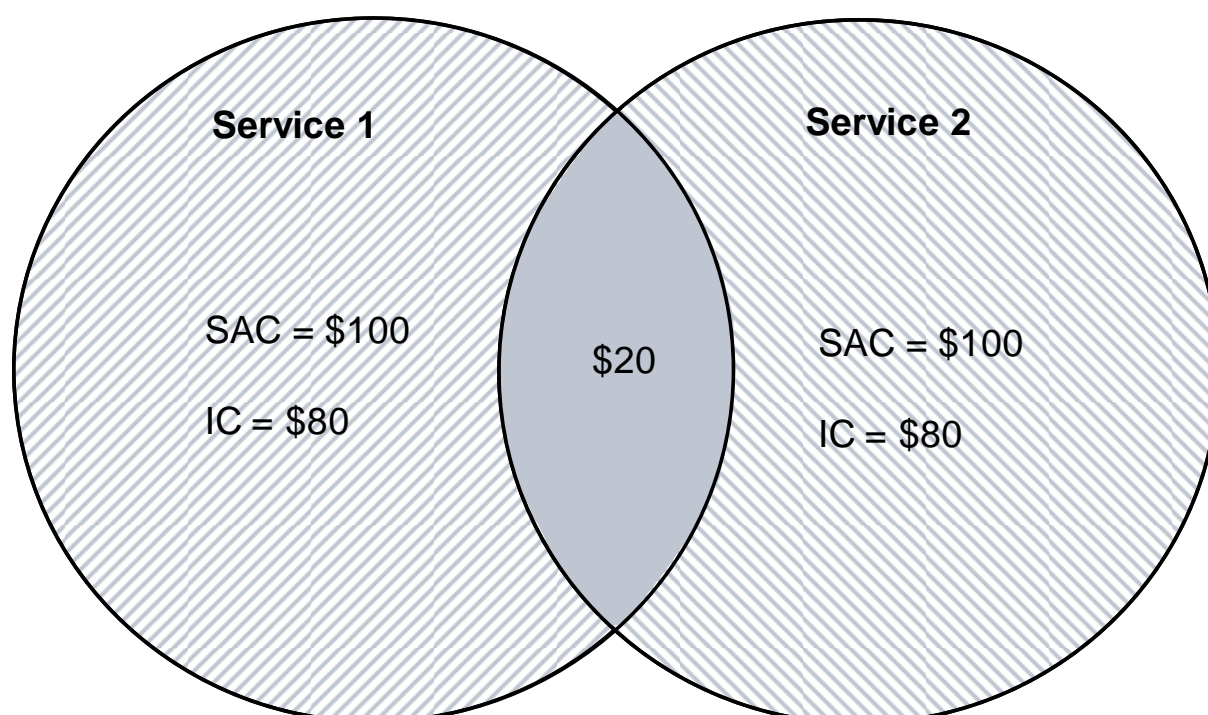
- 3.2.5 As noted in the introduction to this chapter, the term ‘common costs’ is undefined in the Act, but can be interpreted and measured in different ways.
- 3.2.6 Paragraphs 3.2.8 to 3.2.26 explain the key economic and accounting concepts relevant to the reference to ‘common costs’ in s 52T(1)(a)(iii). They also explain why setting a cost allocation IM that allocates all costs associated with the supply of regulated services will implicitly allocate ‘common costs’ as required under s 52T(1)(a)(iii), irrespective of how the term is defined.
- 3.2.7 Following this, paragraphs 3.2.27 to 3.2.31 explain the relevance of these concepts to the costs actually shared between different services supplied by EDBs and GPBs.

Economic and accounting cost concepts relevant to common costs and efficiency gains

Stand-alone costs and efficiency gains

- 3.2.8 For a firm that only provides a single type of service, all of its costs, referred to as the ‘stand-alone cost’ (SAC) (comprising both operating costs and capital costs), are incurred in providing that service. In a workably competitive market, firms can make efficiency gains by offering one or more additional services which:
- utilise some or all of the firm’s existing assets and/or operations that are already utilised in supplying the original type of service; and/or
 - can optimise the size of indivisible assets that can be shared.
- 3.2.9 The cost structure of a firm supplying two types of services (i.e. Services 1 and 2), and the resulting efficiency gains arising from the supply of these services in combination are illustrated in Figure 3.1.

Figure 3.1 Stand-Alone Costs, Incremental Costs, and Efficiency Gains from the Provision of Two Services



Note: IC means incremental cost; SAC means stand-alone cost

- 3.2.10 For the purposes of this example, the SAC of supplying Service 1 (SAC_1), is \$100 and is represented by the full area of the left circle. The SAC of supplying Service 2 (SAC_2), represented by the full area of right circle, is similarly \$100. If the two types of services were each supplied individually on a stand-alone basis (e.g. by two different firms), the total cost of doing so would be \$200 (i.e. $SAC_1 + SAC_2$).¹³³
- 3.2.11 The efficiency gains, or ‘economies of scope’ (refer to Chapter 2), of supplying both services in combination (e.g. by a single firm), compared to supplying each type of service separately (e.g. by different firms), are \$20.¹³⁴ These efficiency gains of \$20 are represented in Figure 3.1 by the intersection of the two circles representing the two services and reflect the savings the supplier makes as a result of the combined provision of both Service 1 and Service 2. Therefore, the SAC of a firm supplying both services at the same time is equal to \$180 (i.e. $SAC_1 + SAC_2 - \$20 = \180).
- 3.2.12 The efficiency gains are equal to the sum of the SACs of supplying each type of service individually (i.e. $SAC_1 + SAC_2 = \$100 + \$100 = \$200$), less the SAC of supplying both types of services together (i.e. $SAC_{12} = \$180$).

Economic common costs and incremental costs

- 3.2.13 Economists sometimes refer to ‘common costs’ as all costs that are not incremental costs (ICs).¹³⁵ In comparing a scenario where two types of services are supplied together, with a scenario where the two types of services are supplied separately, the efficiency gains are the difference in costs in moving from the more expensive supply scenario to the more efficient scenario. The term ‘common costs’ is also sometimes used to describe this efficiency gain (i.e. the economies of scope associated with the supply of both types of services together).¹³⁶ This specific meaning of ‘common cost’ is termed ‘economic common cost’ in this chapter. In the example above, the efficiency gains and the economic common costs are the \$20.
- 3.2.14 The economic common costs can be derived from the difference between the SAC of supplying a group of services on a stand-alone basis, and the sum of the ICs of supplying each service in that group individually.

¹³³ The concepts in this example apply equally whether or not the services are supplied by different firms.

¹³⁴ As is explained in Chapter 2, economies of scope arise when it is less expensive to produce different types of goods or services together (such as in a single firm) rather than separately (such as in two distinct firms).

¹³⁵ ‘IC’ means the additional cost (i.e. including both operating costs and capital costs) that would be incurred if a given service (or group of services) was provided in addition to an existing service (or group of services). The IC is also the cost that could be avoided by ceasing to provide one service whilst continuing to provide another service (i.e. the ‘avoidable cost’).

¹³⁶ For example: “A firm’s common costs are costs incurred in the provision of some or all the firm’s services that are not incremental to any individual service. Hence, common costs can be avoided only by shutting down the entire firm or by not producing a particular group of services under study. Consistent with the FCC’s [Federal Communications Commission] approach we use the term common costs to refer collectively to all costs that are not incremental costs. ... The difference between a firm’s total costs and the sum of its incremental costs equals the firm’s shared costs and common costs. ... The firm’s shared costs and common costs are precisely its economies of scope, which means that they are the firm’s efficiency gains from jointly producing multiple services” (Sidak J.G and Spulber D.F, *Deregulatory Takings and the Regulatory Contract, The Competitive Transformation of Network Industries in the United States*, Cambridge University Press, 1998, pp. 312-313 and 406.)

- 3.2.15 In Figure 3.1 the IC of supplying Service 2 (IC_2) for a firm that supplies both types of services is \$80. This is the additional cost of supplying Service 2 if Service 1 is already being supplied at a SAC_1 of \$100. Similarly, the IC of supplying Service 1 (IC_1) is also \$80 assuming Service 2 is already supplied. Therefore, by definition, the economic common costs are $SAC_{12} - (IC_1 + IC_2)$, which is $\$180 - (\$80 + \$80) = \20 (i.e. equal to the efficiency gains). As stated above, these economic common costs of \$20 are represented in Figure 3.1 by the intersection of circles that represent the SACs of Service 1 and Service 2.
- 3.2.16 In the example, economic common costs arise only when the two services are supplied in combination, whereas two sets of costs would be incurred if the services were supplied completely independently, and there would be no economic common costs. As discussed above, the economic common costs can therefore be thought of as the efficiency gains due to economies of scope. It is noteworthy, however, that the economic common costs, and the SACs and ICs from which they are derived, involve a comparison of an existing supply arrangement with a more costly supply arrangement that may be hypothetical. In the example, if the services have never been supplied independently, then the values for SAC_1 and SAC_2 must be estimated. Determining SACs and ICs (and therefore economic common costs) can therefore be problematic in practice.¹³⁷

Shared costs

- 3.2.17 In Figure 3.1 the economic common costs appear to be the costs that are ‘shared’ between, or ‘common’ to the two types of services. However, economic common costs are not typically the same as the costs that would, either in a plain English sense or in accounting terms, be described as ‘shared costs’ or ‘common costs’.
- 3.2.18 To provide an example involving operating costs, suppose HR staff costs are reduced from \$50 (out of the combined SACs of \$200, in the case where the two types of services are supplied by separate firms), to \$30 (out of \$180, where both types of services are supplied by a single firm) yielding an efficiency gain of \$20. Suppose also that the costs of all other activities are directly attributable to either Service 1 or Service 2, such that HR staff costs are the only costs shared between the two services. If HR staff did not record how much time they spent on activities related to either type of service, then the shared costs would be described as the total amount of the HR costs—i.e. \$30. Hence, the shared costs of \$30 (which could be shown in Figure 3.1 as a slightly greater area of overlap between the two circles than that shown) would exceed the economic common costs (or efficiency gains) of \$20.
- 3.2.19 The difference between economic common costs and shared costs can be even more pronounced in the context of indivisible assets. For example, assume that two electricity distribution networks are operated by two different EDBs and, for simplicity, only two transformers with a combined asset value of \$200 are required to deliver these services. If the two EDBs merge, the service can be operated using a

¹³⁷ For example: “What is the Proper Method for Measuring Incremental and/or Stand-Alone Cost? Although these cost definitions are quite clear conceptually, the practical implementation of measurement methods has been perhaps the most vexing problem in regulatory economics over the past 40 years. Dispassionate scholars disagree on cost measurement methods, and parties to regulatory proceedings usually have very different views of appropriate methods” (Faulhaber G.R., Cross-subsidy analysis with more than two services, *Journal of Competition Law & Economics*, 441, September 2005).

single transformer with an asset value of \$180. Using the same numerical example set out in Figure 3.1, the economic common cost (or the efficiency gains from achieving economies of scope) arising from the combination of these two services is \$20. The shared cost, will, however, be the full \$180 cost of the single transformer as the entire asset is required to provide both services.

- 3.2.20 The shared costs captured by the firm's accounting systems are therefore unlikely to equal the economic common costs. The shared costs captured by the firm's accounting system are likely to be a measure of the total cost of supplying all the services, which is required to be shared across each type of service. As discussed above, economic common costs on the other hand, reflect the efficiency gains generated as a result of supplying both services together. These reflect the difference in costs between the way the firm currently supplies the services, and a counterfactual that involves an alternative way of supplying the services that might never have actually occurred in practice. Accounting systems are not typically intended to capture such potentially hypothetical costs, as the firm's management is interested in recording costs that are actually incurred and, where appropriate, developing rules for how to allocate these costs.
- 3.2.21 The extent to which costs are recognised in a particular accounting system as being shared, will also depend on the detail of the way in which accounting information is captured by the firm (i.e. the level of detail these systems provide). For instance, as the operating cost example above demonstrates, if staff do not record the time they spend on particular activities associated with the provision of a service then it will be difficult for the firm's accounting system to attribute staff costs.
- 3.2.22 On the other hand, if staff are required to fill in timesheets used alongside a more detailed accounting system, it may be possible for a firm to attribute all of its staff costs across the different types of services it supplies. This is why the description as to what constitutes a shared cost (and hence the allocation of shared costs) may vary significantly even between similar firms supplying the same types of services.

Accounting cost concepts used in the IM

- 3.2.23 The costs which a firm would likely consider to be 'shared' will be those costs which its accounting system treats as being related to more than one service (i.e. as not attributable to a particular service). The magnitude of the shared costs identified by that firm will depend on how its accounting system attributes costs. To clarify the way in which these costs should be measured, the Commission's starting point for the cost allocation IM is to divide costs into costs that are 'directly attributable' and costs that are 'not directly attributable'. This better reflects how shared costs are likely to be recorded in practice, and is therefore more meaningful than simply referring to costs that are 'shared'.
- 3.2.24 In the context of this IM, costs directly attributable are defined as those which can be wholly and solely associated with a single type of regulated service (i.e. electricity distribution services, gas distribution services or gas transmission services), or wholly and solely associated with the unregulated services (in aggregate) supplied by an EDB or GPB. Costs not directly attributable are all other costs, namely those which cannot be wholly and solely associated with a single type of regulated service (or wholly and solely associated with the unregulated services).

- 3.2.25 The cost allocation IM allocates all costs associated with regulated services whether they are directly attributable or not directly attributable. By doing so, common costs —irrespective of how they are interpreted—will be allocated between different types of regulated and unregulated services, without explicitly having to define, identify and allocate common costs which, as discussed above, can be defined and measured in different ways.
- 3.2.26 The IM therefore requires that operating costs and asset values that are directly attributable to a particular type of regulated service are allocated to that type of regulated service. It also sets out rules for deciding what proportion of operating costs and asset values associated with but not directly attributable to a regulated service may be recovered from that regulated service. Since the Commission is only concerned with setting rules for the allocation of costs to regulated services, the IM does not include any mandatory steps for allocating costs that are wholly and solely associated with unregulated services.¹³⁸

EDB and GPB sector context

Scope of shared costs

- 3.2.27 EDBs and GPBs, in addition to providing one or more services regulated under Part 4 of the Act, also typically provide services that are unregulated. The extent to which regulated suppliers provide unregulated services varies significantly.¹³⁹
- 3.2.28 Some EDBs report that they focus fully or almost exclusively on providing regulated electricity distribution services, so that little or no cost sharing occurs.¹⁴⁰ For other businesses, up to 20% of their total operating costs and up to 10% of their asset base are reported to be shared between regulated and unregulated services.¹⁴¹
- 3.2.29 Similarly, the extent to which GPBs' regulated services share costs with unregulated services varies. Vector submitted that for its GPB 8% of total operating costs are shared between regulated and unregulated services.¹⁴² Powerco stated that for its GPB less than 1-2% of its total operating costs and less than 3% of its assets are shared with unregulated services.¹⁴³ Cost sharing (in particular of corporate

¹³⁸ Under s 53D of the Act, a regulated supplier can be required to disclose information related to the supply of unregulated services (in aggregate) for the purpose of monitoring compliance with information disclosure regulation. The requirement to disclose may also arise in the context of the voluntary OVABAA. This is further discussed in Section 3.3.

¹³⁹ Examples of unregulated services provided by EDBs include tree-trimming, civil contracting and network management services. GasNet also submitted that it operates a point-of-sale metering service (GasNet Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 10, answer to question 14). For a full list of the different types of unregulated services provided by EDBs see Table C1 in the appendix.

¹⁴⁰ Orion New Zealand Limited, *Submission on Input Methodologies Discussion Paper*, 14 August 2009, p. 14, paragraph 50.

¹⁴¹ See, for example: PricewaterhouseCoopers on behalf of 21 Electricity Distribution Businesses, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 26, Appendix B.

¹⁴² Vector Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 40, paragraph 96.

¹⁴³ Powerco Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 3, paragraphs 9-10.

overhead costs) also occurs between different regulated services operated by regulated suppliers e.g. between electricity distribution and gas pipeline services.¹⁴⁴

- 3.2.30 In developing the cost allocation IM, the Commission has also had regard to potential new business areas. This is of particular importance since the Government's Ultra-Fast Broadband Initiative proposes to commit up to \$1.35 billion of public funds alongside private sector investment to roll out an ultra-fast fibre-optic broadband network for New Zealand.¹⁴⁵ The Ministry of Economic Development (MED) considers that:

"Supply-side complementary measures [such as the use of gas ducts and electricity poles which reduce the cost of roll out] will accelerate the deployment of ultra-fast broadband infrastructure by improving the business case supporting the investment. These measures would also reduce the timeframes for deployment, which would assist the Government's Objective."¹⁴⁶

- 3.2.31 A number of EDBs have submitted tenders to participate in the Ultra-Fast Broadband Initiative. The roll out of ultra-fast broadband that shares electricity poles or ducts (and the development of other new services that may be launched by EDBs and GPBs) increases the potential for suppliers to achieve economics of scope in the future. Given this potential, the importance of having a cost allocation IM that promotes outcomes consistent with those produced in workably competitive markets increases since consumers of regulated services may otherwise not benefit from efficiencies arising in the supply of regulated services, including through lower prices.

Currently used cost allocation methodology

- 3.2.32 EDBs are currently required under the Electricity Distribution (Information Disclosure) Requirements 2008 to apply the avoidable cost allocation methodology (ACAM) to the allocation of costs between electricity distribution services and any other services, whether those services are regulated under Part 4 or not.¹⁴⁷
- 3.2.33 ACAM is an accounting approach that, as currently specified for EDBs, considers which costs would be avoided if a supplier no longer supplied services other than electricity distribution services. ACAM requires an estimation of the costs of supplying other services which would be avoided if only electricity distribution services (or gas transmission or gas transmission services) were supplied. Implicitly,

¹⁴⁴ Note that submitters were not required to apply the definition of shared cost in the IM (i.e. cost not directly attributable). As such, the shared cost figures reported by submitters may be higher or lower than those consistent with that definition.

¹⁴⁵ MED, *New Zealand Government Ultra-Fast Broadband Initiative, Overview of Amendments*, July 8th 2010.

¹⁴⁶ MED, *Facilitating the Deployment of Broadband — Discussion Document*, October 2009, p. 10.

¹⁴⁷ An ACAM approach has been mandated for EDBs since the late 1990s through a handbook under the information disclosure regulations, which subsequently became incorporated into the Part 4A information disclosure requirements (Commerce Commission, *Regulation of Electricity Lines Businesses, Information Disclosure Regime, Electricity Information Disclosure Handbook*, 31 March 2004 (as amended 31 October 2008), pp. 6-7, paragraph 2.2). The Commission has previously expressed the view that, in the context of Part 4A, it considered ACAM to be an inappropriate cost allocation methodology, but that it intended to consult on the allocation of shared costs as part of the second stage of amendments to the information disclosure requirements (see Commerce Commission, *Regulation of Electricity Lines Businesses, Information Disclosure Regime, Companion Paper to the Revised Information Disclosure Requirements*, 31 October 2008, pp. 36-37).

the remaining costs approximate the SAC for supplying the type of regulated service in question.

- 3.2.34 GPBs are not currently required under the Gas (Information Disclosure) Regulations 1997 to apply any specific methodology for cost allocation.¹⁴⁸ Regulation 21(1) provides that within five months after the end of each financial year (beginning with the 1996-1997 financial year), every pipeline owner must publicly disclose the methodology used in relation to the allocation of costs.¹⁴⁹ Amendments were proposed to these regulations but they never came into force. The proposed amendments to cost allocation included the mandatory use of ACAM, the disclosure of full details of how ACAM has been applied, and a requirement for separate stand-alone financial statements for transmission and distribution services and for the combined transmission and distribution services.¹⁵⁰
- 3.2.35 Although ACAM is not mandatory for GPBs, it appears that it (or an approach that achieves a similar cost allocation) is also used by GPBs in instances where a cost allocation methodology is required for allocating costs to regulated services.¹⁵¹

Incentives for efficiency in workably competitive markets

- 3.2.36 In a workably competitive market, a firm that supplies a single type of service may temporarily achieve a competitive cost advantage over its competitors through diversification by providing additional types of services. Over the period in which none of its competitors supply the same expanded mix of services, a multi-service firm may charge (up to) the same level of prices as its competitors and benefit from its higher relative efficiency by earning above-normal profits.¹⁵²
- 3.2.37 For example, if the firm in Figure 3.1 is the first firm to supply both services, it will initially be able to charge prices that recover up to the combined individual SACs of \$200 without losing market share to its competitors.
- 3.2.38 The prospect of these above-normal profits creates the incentive to utilise existing operations and assets to supply other types of services and achieve economies of scope.

¹⁴⁸ No explicit cost allocation approach was identified under the Gas Authorisation (covering the gas distribution services and gas transmission services provided by Powerco and Vector). Instead, the Commission formed its own view about the costs that the GPBs may recover through their allowed revenues.

¹⁴⁹ Governor-General, *Gas (Information Disclosure) Regulations 1997 (SR 1997/127)*, 7 July 1997, clause 21(1).

¹⁵⁰ Energy Markets Policy Group, *Proposals for Amending the Gas (Information Disclosure) Regulations 1997*, 10 February 2000, paragraph 2.1.

¹⁵¹ Powerco submitted that shared costs are accounted for in the financial statements of EDBs and GPBs using ACAM. Vector submitted that it regarded ACAM as the preferable cost allocation approach. GasNet stated that “overall GasNet’s experience would be that the ACAM approach is very workable, it would seem, based on the work it does do itself implicitly now.” Maui Development Ltd (MDL) also submitted on this subject and stated that the best and most practical method of calculating financial performance and efficiency measures is to calculate stand-alone accounts for the Maui Pipeline business. See Powerco Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 4, paragraph 13, answer to question 9; Vector Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 16 March 2010, p. 11, paragraph 23; Mr. Coe on behalf of GasNet, *Electricity Distribution Businesses and Gas Pipeline Businesses Workshop Transcript*, 24 February 2010, p. 19, lines 10-24; Maui Development Limited, *Submission on the Input Methodologies Discussion Paper*, July 2009, p. 21, paragraph 2.

¹⁵² For a more general discussion of workably competitive markets, refer to Chapter 2.

Sharing of efficiencies with consumers

- 3.2.39 In the longer-term, competitors in workably competitive markets will generally imitate the business model of the firm that first succeeded in achieving the economies of scope.¹⁵³ Consequently, the above-normal profits will generally be competed away and the firm will not be able to keep the benefit of its efficiency gains over the longer-term.¹⁵⁴
- 3.2.40 Returning to the example in Figure 3.1, once the competitors of the firm diversify into supplying additional services in a similar manner, the firm will be limited to charging prices that only recover the efficient cost of supplying both services together—i.e. \$180.
- 3.2.41 The competitive process and the prices of the services that result from it determine which customers eventually receive the benefits of the efficiency gains.
- 3.2.42 The competitive process leads to the benefits of efficiency gains initially realised by the firm in the form of above-normal profits being shared with consumers over time, including through lower prices. This results in the following:
- consumers facing lower prices and/or receiving better quality for the relevant services than would have prevailed had these efficiency gains not been made; and
 - from the point when the firm earns only a normal profit, the benefits from these efficiency gains continuing to be enjoyed by consumers on an ongoing basis.
- 3.2.43 Both the efficiency gains and the shared costs resulting in these efficiencies are common to both services. The efficiency gains are not exclusively the result of providing a new service or the existing service. The efficiency gains from economies of scope would not exist were it not for the existence of *both* the existing and the additional service that are provided in combination.

Legal interpretation of s 52A(1)(c)

- 3.2.44 A number of submitters suggested that efficiency gains referred to in s 52A(1)(c) do not include those generated as a result of supplying regulated and unregulated services together.¹⁵⁵ They submitted that the Commission should use ACAM, because it allocates all shared costs to the regulated services, and does not require

¹⁵³ The terms 'longer-term' and 'long-run' are used in this chapter to describe a timeframe over which economic concepts, such as prices, costs and profitability are repeatedly exposed, and as a result respond and adjust, to influences from market forces or regulatory policy. They are not used to describe an economic equilibrium outcome. As discussed in Chapter 2, workable competition is a dynamic process and does not necessarily ever result in a static equilibrium.

¹⁵⁴ This outcome is one of the type referred to in s 52A(1)(d) of the Act.

¹⁵⁵ See, for example: Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, pp. 5-7, paragraphs 15-20; Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 16-18, paragraphs 64-73, p. 31, paragraphs 119-121; Unison Networks Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 13-16, paragraphs 38-47.

“any allocation to unregulated services of costs common to regulated and unregulated services”.¹⁵⁶

- 3.2.45 These submitters rely on the language of s 52A(1)(c), which states that ‘the benefits of efficiency gains in the supply of the *regulated goods and services*’ (emphasis added) should be shared with consumers of the regulated services. They argue that this phrase accordingly means efficiencies related *only* to costs or assets that are exclusively used in the supply of the regulated services, and not efficiencies related to costs and assets that are shared by regulated and unregulated services.¹⁵⁷ They also argue that there is no need to share any efficiency gains associated in any way with the supply of unregulated services with consumers of the regulated services, even where these efficiency gains are associated with the economies of scope of supplying both services.¹⁵⁸ The Commission disagrees.
- 3.2.46 Section 52A(1)(c) does not require any words to be read into it in order to ascertain its meaning. The gains referred to are made in the supply of regulated services. Submitters’ narrow argument regarding s 52A(1)(c)—involving the insertion of the word ‘only’— would remove the main reason for requiring the Commission to set a cost allocation IM and would make redundant those parts of s 52T(3) which relate to unregulated services. If no shared costs are to be borne by unregulated goods or services, by definition 100% of these costs will be allocated to regulated services. Had Parliament intended that all shared costs should be allocated to regulated services under the IM, then it would have been straightforward to make that explicit in the legislation.¹⁵⁹

¹⁵⁶ Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 9, paragraph 29. Vector also drew on comments made at the IM Conference about the ability to leverage costs of regulated services for the advantage of promoting broadband in New Zealand and in doing so argued that “a SAC/IC cost allocation approach is the best cost allocation method to enable EDBs and GPBs to participate in Government strategies” (Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 32-33, paragraphs 126-127). In doing so, Vector implied that any allocation of common costs to unregulated services would not allow them to take advantage of economies of scale and scope. However, such leveraging does not require that regulated suppliers should be able to take advantage of all the economies of scale and scope in the supply of their unregulated services.

¹⁵⁷ Unison Networks Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 13-14, paragraph 38.

¹⁵⁸ Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 17, paragraph 70. Submitters also referred to the legislative history of s 52A(1)(c) of the Act and argued that “it is clear that Parliament intended it to relate to the sharing of efficiency gains in the supply of regulated services only” (see, for example Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 1, paragraph 3) and in doing so quoted a submission made by Vector during consultation rounds for the drafting of Part 4, and drafting changes made by MED as a result of that submission as further evidence to support the view that their interpretation of the Act is correct (see, for example Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 6, paragraph 17, and Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 17-18, paragraph 71, both referring to Vector, *Submission on the Review of Parts 4, 4a and 5 of the Commerce Act*, 7 December 2007).

¹⁵⁹ Furthermore, references made by submitters to submissions made as part of consultation rounds for the drafting of Part 4, and linkages made by them between these submissions and resulting changes made in legislation are misleading. At that time Vector only submitted that a “disproportionate amount” of shared costs—namely that which is “above a level that could be competitively recovered”—should not be allocated away from regulated businesses (see Vector, *Submission on the Review of Parts 4, 4a and 5 of the Commerce Act*, 7 December 2007, p. 17). Vector’s proposed

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- 3.2.47 As such, consumers of regulated services should share in the benefit of such gains, including through lower prices, because these gains are associated with the supply of regulated services. Sharing efficiency gains across all of the services to which the economies of scope relate is consistent with outcomes produced in workably competitive markets.

Economic insights on sharing efficiency between consumers in workably competitive markets

- 3.2.48 Prices in workably competitive markets are influenced by demand-side (e.g. consumers' willingness to pay for a service with a given quality) and supply-side factors (e.g. the cost of inputs, and production technology such as that used in achieving economies of scope).
- 3.2.49 Managers of firms in workably competitive markets adjust prices to maximise profits for all services in the hope that all costs (including shared costs) incurred in the provision of these services are recovered. In order to do this, managers implicitly take into account consumers' willingness to pay for the services.¹⁶⁰
- 3.2.50 As such, they are therefore unlikely to contemplate concepts such as economic common costs, shared costs or attributable costs (or the use of a cost allocation methodology to identify these) in their pricing decisions.¹⁶¹
- 3.2.51 Demand for a service being unresponsive to price implies consumers have a high 'willingness to pay' for the service. Among a set of services with shared costs provided by a given firm, a service characterised by a low demand-responsiveness to price increases can be expected to recover a greater proportion of the shared costs than a service that is more demand-responsive. Conversely, if demand is responsive to price then consumers are likely to switch to a substitute service if the price increases even by a relatively small amount.¹⁶²

drafting changes were not accepted and the MED made clear in its report to the Select Committee that cost allocations between contestable and monopoly services are "very complex and contentious" and it "would be inappropriate to specify a particular approach in legislation: this is a matter for the Commission to determine" (see MED, *Commerce Amendment Bill, Report of the Ministry of Economic Development*, 4 July 2008, p. 13).

¹⁶⁰ This makes the simplifying assumption that firms only have control over certain supply-side factors. In practice, firms in workably competitive markets may also affect demand through marketing and advertising.

¹⁶¹ Nonetheless, although a firm's managers might not explicitly use a cost allocation methodology for setting prices, they may want to monitor the performance of new or existing ventures (e.g. the profitability of new product lines). For example they will wish to monitor services' revenue against the incremental costs of introducing these new services. Where not all costs are directly attributable to different types of services, this requires them to apply some form of cost allocation methodology to allocate shared costs to those services using the firm's accounting system.

¹⁶² Ramsey pricing formalises the insight about the relevance of the consumers' willingness to pay in achieving the most efficient pricing for a firm that supplies different types of services and makes a normal return. According to Ramsey pricing, it is allocatively efficient to recover a higher proportion of costs not directly attributable from customers whose demand is less responsive to changes in price. See, for example: W. Baumol and D. Bradford, Optimal departures from marginal cost pricing, *American Economic Review*, 60, 1970.

While theoretically appealing, due to significant practical hurdles in applying Ramsey pricing principles in the context of cost allocation, there are few if any regulators that implement such an approach. The main issues associated with implementing cost allocation based on Ramsey principles include: (1) the need to accurately estimate relevant demand-responsiveness parameters; (2) the lack of fit-for-purpose demand data available to regulated suppliers; (3) the complexity of calculations; and (4) the inability to impose a zero-profit constraint across all of a suppliers' services (both regulated and unregulated), which is one of the underlying assumptions of Ramsey pricing. Vector agreed with "the Commission's view that Ramsey principles would in theory provide an efficient way of allocating EDB / GPB shared costs consistent with workably competitive market outcomes" and that "Ramsey principles can't be strictly

3.2.52 Despite this, in the longer-term, all services are expected to recover some proportion of shared costs.¹⁶³

3.2.53 Experts advising EDBs and GPBs (as well as Airports) unanimously agreed that in workably competitive markets firms would expect to recover some proportion of shared costs from all services in the longer-term.¹⁶⁴ As such, some benefits of efficiency gains would be shared with consumers of all types of services with shared costs.

3.2.54 However, Vector argued in its submissions that:

... under the Part 4 regime, Parliament has for the first time provided express statutory direction to the Commission in relation to the allocation of costs between regulated and unregulated businesses. These provisions reflect the underlying policy position previously articulated in the 2006 GPS; to promote incentives to invest in unregulated businesses by enabling regulated businesses to leverage off their assets (provided that consumers are not disadvantaged)...¹⁶⁵

3.2.55 In addition, Unison submitted:

Those EnDBs participating in the bid process [under the ultra-fast broadband initiative] will naturally seek to leverage their assets to compete against Chorus/Telecom to become the local fibre company...by deploying fibre on existing electricity poles at incremental costs, EnDBs can lower their overall bid costs, and thereby achieve the government's objectives at lower cost and potentially much more quickly. EnDB's customers are not disadvantaged by such an approach.¹⁶⁶

3.2.56 The Commission does not consider that an approach which allocates all shared costs to the regulated businesses will produce outcomes which are consistent with those occurring in workably competitive markets. The fact that suppliers are intending to achieve economies of scope by leveraging off existing services is irrelevant in this discussion. The order in which services were first provided does not matter when considering the allocation of shared costs or the sharing of benefits from efficiency gains with consumers achieved by the firm as a whole over the longer-term.¹⁶⁷ Baumol and Sidak (1994) illustrate this insight with the following example:

... suppose that equipment used to produce service X and equipment used to produce equipment Y are both housed in a single space that must be carefully air-conditioned to prevent contamination of the equipment. The outlay for air conditioning must be made if the company supplies only X, only Y, or both X and Y. Consequently, the cost of the air-conditioning equipment is not incremental to either X or Y alone. If either service were discontinued, the company could not avoid the cost of replacing the air conditioner

applied" (see Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 25, paragraph 99).

¹⁶³ An exception to this would be the extreme—and hence implausible—case where one service with shared costs is infinitely demand-responsive.

¹⁶⁴ Mr. Murray from LECG, Mr. Balchin from PricewaterhouseCoopers, Mr. Mellsope from NERA, *Input Methodologies Conference (Airport Services) Transcript*, 15 September 2009, pp. 48-49, lines 29-15.

¹⁶⁵ Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 2, paragraph 12.

¹⁶⁶ Unison Networks Limited, *Cross Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper*, 2 September 2010, p. 5, paragraph 6.

¹⁶⁷ William J. Baumol and J. Gregory Sidak, *Toward Competition in Local Telephony*, Cambridge, Mass.: MIT Press, 1994, p. 69.

when the time for that arrived. **Nor can one argue that the air conditioner cost is the responsibility of the service that happened to be provided first. That the company started to supply X in 1980, while Y was not introduced until 1987, is an irrelevant piece of history.** Today, neither service can be provided without the air-conditioning, and once the firm has decided to continue either one of the services, provision of the other adds zero to total air-conditioning costs. Thus the [shared cost] is not part of the incremental cost of either X or Y... (emphasis added)

3.2.57 Furthermore, the Part 4 Purpose is not designed to ensure that customers of the regulated suppliers are 'not disadvantaged' or are no worse off as a result of cost allocation methodologies employed by regulated suppliers. Rather, the Part 4 Purpose is to promote the 'long-term' benefit of these consumers.

EDB and GPB service demand-responsiveness

3.2.58 The following sets out the likely demand-responsiveness of the different services provided by EDBs and GPBs:

- Electricity distribution services—Demand for electricity distribution services is derived from the demand for electricity. Hence, to reduce the demand for electricity distribution would require consumers to reduce their need for EDB distributed electricity, for example through use of distributed generation or other forms of energy. With current technologies the cost of switching to alternatives would in many instances be considerable higher than relying on distributed electricity.¹⁶⁸ Consequently, demand for EDB electricity distribution services for many consumers is demand-unresponsive in the longer-term.¹⁶⁹
- Gas pipeline services—Gas has a somewhat wider range of substitutes than electricity so demand-responsiveness is likely to be greater. Possible substitutes for gas include electricity and other types of primary energy used for distributed electricity generation or for domestic heating. Further, bottled gas is a substitute for piped gas. Overall, demand-responsiveness for connection to the gas network is likely to be moderately low in the longer-term.¹⁷⁰
- Unregulated services—Demand-responsiveness for the range of unregulated services provided by EDBs and GPBs is likely to vary significantly. It is therefore not possible for the Commission to conclude with certainty what their likely demand-responsiveness to price changes is. However, in a number

¹⁶⁸ Technological progress can be expected to make alternatives to distributed electricity more economically viable over time.

¹⁶⁹ A review of some of the New Zealand specific empirical evidence on price elasticities of demand for energy reveals that the price responsiveness is similar to that found in other developed countries. For example, Fatai et al., using several modelling approaches, find a NZ price elasticity of demand for electricity of around -0.2 in the short-run, and around -0.5 in the long-run. The econometric electricity demand model developed by the Electricity Commission estimates a price elasticity of -0.125. See Fatai, K., Oxley, L., Scrimgeour, F.G, Modelling and Forecasting the Demand for Electricity in New Zealand: A Comparison of Alternative Approaches, *The Energy Journal*, 2003, Vol. 24, No. 1; and Electricity Commission, *Electricity Demand Forecast Review*, 11 February 2008.

¹⁷⁰ For example, using evidence from the international literature the MED, as part of cost benefit analysis undertaken for the New Zealand energy strategy, assumed a short-run price elasticity of demand of -0.1 and a long-run price elasticity of demand of -0.2 for different types of users of energy (including gas). (See Ministry of Economic Development, *Benefit-Cost Analysis of the New Zealand Energy Strategy*, November 2007).

of instances the demand-responsiveness is likely to be greater than that for electricity distribution services and gas pipeline services in the longer-term.

Implications for efficiency sharing with consumers of regulated services in the longer-term

- 3.2.59 To promote outcomes consistent with those produced in workably competitive markets, and to achieve the objective set out in s 52A(1)(c), all types of services should bear some portion of shared costs in the longer-term.
- 3.2.60 Where a supplier provides electricity distribution, gas distribution and/or gas transmission services together, the overall demand-responsiveness of the different services will be similar. A similar allocation of shared costs to each regulated services and a not too dissimilar sharing of benefits of efficiencies with consumers of the different types of regulated services is likely to be consistent with outcomes produced in workably competitive markets.¹⁷¹
- 3.2.61 In contrast, where an EDB and/or GPB also provides unregulated services, the demand-responsiveness of each regulated service will in a number of cases be lower than that for unregulated services. In such instances, an allocation of a larger proportion of shared costs to regulated services is consistent with outcomes in workably competitive markets. In those situations only some of the benefits of efficiency gains would be expected to be shared with consumers of regulated services.
- 3.2.62 In setting this IM, the Commission has considered whether the use of ACAM as used and/or advocated by EDBs and GPBs would promote these outcomes in the longer-term. The application of ACAM would result in regulated services bearing all shared costs and unregulated services not bearing any.
- 3.2.63 Where prices are set to recover costs allocated on this basis, the application of ACAM leads to none of the efficiency gains associated with the provision of regulated services being shared between the supplier and consumers of regulated services.¹⁷² ACAM therefore leads to all efficiency gains being captured by the supplier in higher profits, or, to the extent that prices are lower, passed on to the consumers of unregulated services rather than consumers of regulated services.¹⁷³ (A supplier may also set all services' prices equal to cost with shared costs allocated between services in the short-term, in which case it only earns a normal return. However, a supplier's incentives are to maximise its profits and suppliers are likely to only do this in situations where competitive constraints already apply in the short-term).
- 3.2.64 As noted by Professor George Yarrow, in workably competitive markets an outcome where a service would bear all shared costs would be unlikely "since, speaking in very broad terms, it implies that the consumers of the product/service bearing all the

¹⁷¹ This means that the allocation of shared costs between gas transmission and gas distribution services would be proportional to some measure of demand, e.g. revenue. A somewhat greater proportion of costs might be allocated to electricity distribution where costs are shared between electricity distribution, and gas distribution and/or gas transmission services.

¹⁷² For further discussion of the issues with ACAM see Commerce Commission, *Input Methodologies (Electricity Distribution) — Emerging Views Paper*, 23 December 2009, pp. 23-24.

¹⁷³ For further discussion of outcomes under ACAM see Appendix B5.

common costs would, in effect, have no collective weight in influencing relative prices. Such an outcome appears to me to be consistent only with a complete absence of competition, since any form of competition for the business of the relevant consumers will give them some influence over the decisions of the suppliers seeking their business.”¹⁷⁴

- 3.2.65 Overall, the Commission has concluded that the application of ACAM will in most instances not promote cost allocation and efficiency sharing outcomes consistent with those that occur in workably competitive markets.¹⁷⁵ It is possible, however, that where shared costs are low, an approach that allocates shared costs between regulated and unregulated services will not produce outcomes that are materially different from those that would arise under ACAM. In these circumstances the use of ACAM may not result in outcomes that stray far from those that occur in workably competitive markets. This possibility is discussed further in Section 3.3.

Efficiency sharing with suppliers

- 3.2.66 The discussion so far has centred on the sharing of efficiencies between consumers of different types of services in the longer-term. Section 52A(1)(c) requires that regulated suppliers, as well as consumers, should share in the efficiency gains, at least to the extent that this would also occur in workably competitive markets.
- 3.2.67 While s 52A(1)(c) is silent on how suppliers should obtain a share of the benefits, s 52A(1)(b) provides that suppliers of regulated services should have incentives to improve efficiency and provide services at a quality that reflects consumer demand. Paragraphs 3.2.36 to 3.2.38 above describe how this occurs in workably competitive markets.
- 3.2.68 Moreover, the level of sharing between the supplier and consumers is expected to change over time (leading to benefits being shared with consumers in the longer-

¹⁷⁴ Yarrow, G., *Review of Input Methodologies (Electricity Distribution Services, Gas Pipeline Services and Airports) Reasons Papers*, December 2010, p. 10.

¹⁷⁵ A number of EDBs currently using ACAM have in place pole sharing agreements with Telecom. Under ‘in-kind’ agreements, EDBs and Telecom allow each other to use their poles in exchange for access to others. If instead of in-kind payments EDBs and Telecom compensated each other via financial transactions and EDBs used ACAM to allocate these shared costs, the degree to which consumers of regulated services benefited from pole sharing efficiency gains would be reduced and quite possibly eliminated. Such a change in cost allocation without corresponding changes in the underlying economics would be less consistent with outcomes observed in workably competitive markets than the current ones. Vector argued that the pole sharing example does not provide a sound basis for demonstrating that ACAM does not promote long-term benefits of consumers. In doing so, Vector made the following submissions: that previous regulations (r 112 Electrical Supply Regulations 1984) “required sharing of poles”, that the arrangements are a one-off anomaly and not an example of a wider issue; that the arrangements have continued since the requirement was revoked (and no similar rights are included in any current regulation); and that there is no basis for considering these arrangements will change in the foreseeable future. Vector also submitted that “if a change did eventuate then consumers would not be disadvantaged because of the operation of the regulated and unregulated business together and/or the ACAM methodology, but because of a change in commercial / regulatory arrangements” (Vector, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 28-29, paragraphs 110-112 and footnote 58). The Commission disagrees with Vector’s reasoning. The former r 112 did not “require” pole sharing, it primarily set out access, implementation and cost-sharing obligations for clearances between electricity and telephony conductors where any pole sharing occurred. These arrangements are not a one-off anomaly driven by historical regulatory requirements, as is illustrated by the continuation of the arrangements since the Electrical Supply Regulations were revoked. Further, Vector’s own reasoning implicitly acknowledges that changes in the form of these arrangements may arise in the future.

term as described above) rather than being permanently split at some particular level between the supplier and consumers.

- 3.2.69 The timeframe for this process varies and depends mainly on the speed with which competitors are able to imitate or improve upon the economies of scope. However, in the short-run, all or part of the benefits of efficiency gains are retained by the firm through above-normal profits, and consumers receive few, if any, of the benefits.
- 3.2.70 To ensure that suppliers of regulated services have incentives to improve efficiency and provide services at a quality that reflects consumer demand, as well as to provide incentives for them to innovate and to invest (as required by s 52A(1)(a)), the IM needs to allow for the different and changing circumstances that could occur in workably competitive markets to the extent this is possible and worthwhile.
- 3.2.71 In the context of EDBs and GPBs, in a situation where a transaction involving regulated suppliers occurs part-way through a regulatory period and results in shared costs, it is desirable to permit the merged business to temporarily retain the benefits from these efficiency gains consistent with outcomes in workably competitive markets. In the longer-term, as the prices resulting in higher profits get competed down, the benefits of these efficiency gains should be shared with consumers.
- 3.2.72 Paragraphs 3.3.23 to 3.3.30 provide further details on the way in which the application of the IM as part of default/customised price-quality regulation will share efficiencies between suppliers and consumers after mergers or acquisitions.

Incentives for investment in other services

- 3.2.73 Section 52T(3) provides that the IM must not unduly deter investment by a supplier of regulated services in the provision of other services. This section sets out relevant insights from workably competitive markets and discusses the relevant submissions on this issue.

Investment in workably competitive markets

- 3.2.74 The expected profitability over the anticipated lifetime of a service is one of the main determinants of a firm's decision to invest (either to develop a new service or to continue providing an existing service).¹⁷⁶ The short-run profitability of services provided in workably competitive markets is determined by a number of factors, including demand input costs and the production technology.
- 3.2.75 In a workably competitive market, a newly established service might not initially be profitable. A firm's management may therefore accept that its services will recover revenue below the level required to recover any shared costs or, equivalently, that all shared costs are initially to be borne by more established services. As services become established, the firm's revenue and profitability will increase, which will in turn determine how much shared cost it recovers through different services.
- 3.2.76 A service that recovers less than its costs of production over the longer-term will not be economically viable. At a minimum, prices for the service need to be sufficient to

¹⁷⁶ For inefficient investments that cannot achieve at least a normal return, the funding required to provide a service, either from internal sources (e.g. existing shareholders) or external sources (e.g. new shareholders or a financial institution) will either not be made available or withdrawn.

recover the incremental costs of providing it. In such instances, if a firm had the opportunity to increase its overall profits by discontinuing that particular service and using the resources employed in it (including those that are shared) to provide higher value services it would do so.

- 3.2.77 The ability of a service to contribute to the recovery of shared costs is potentially one of the factors considered by firms their decision to make necessary investments. In particular, firms may have expectations about being able to achieve economies of scope and hence to set prices above cost to earn above normal-profits in the future. This may lead them to decide that a service needs to recover few or no shared costs while it establishes itself in the market. On the other hand, an investment proposal that is expected to result in diseconomies of scope may not be undertaken.
- 3.2.78 In workably competitive markets, where investment decisions are made under uncertainty, the firm may realise that an investment is inefficient only after some initial investment has been made. In such an instance, the service may be discontinued and the non-service-specific assets would be redeployed elsewhere in the firm or sold off. Workably competitive markets therefore deter investments in services that are expected to be, or turn out to be, unprofitable.
- 3.2.79 Expected profitability, which in turn is affected by a number of factors, is one of the main determinants of investments in workably competitive markets. Any investment analysis undertaken by firms in such markets will evaluate the weight given to each factor in business case analyses. In specific contexts (including the regulatory context in which this IM is set) cost allocation can impact on profitability and play a role in investment decisions. In particular, if another service is forced to recover a disproportionate level of shared costs, its short-term profitability will be affected and the investment might not be undertaken or discontinued (and as such is deterred). The degree to which economies of scope (both the level and the time taken to achieve these) affect investment decisions will vary on a case-by-case basis and other factors may be as, or more, important than considerations of shared costs.

Not unduly deterring investment

- 3.2.80 The inclusion of the word ‘unduly’ in s 52T(3) acknowledges that investment will inevitably be deterred from time to time. The Commission must ensure that the IM does not unduly deter investment. As noted above, in all markets, particular investments are deterred from time to time for any number of reasons. Some degree of deterrence is a possible outcome of a methodology that shares efficiencies. What the Commission must do is ensure that the cost allocation IM does not unduly deter investment.¹⁷⁷

¹⁷⁷ Vector argued based on its interpretation of s 52T(3) that “to give effect to the intended meaning, the Commission must aim not to deter incentives to invest in unregulated businesses *unless* there were good reasons for doing so” and that “a good reason for adopting an approach that deters investment would be because this is necessary to avoid consumers being disadvantaged.” Vector also submitted that “the optional variation approach will not mitigate the deterring effects of the default accounting-approach and that the net deterring effect of the default position is undue or unwarranted” and that ACAM is significantly better than the approach proposed by the Commission (see Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 12, paragraph 52; pp. 19-20, paragraphs 80 and 82; p. 34, paragraph 131). ENA argued that “if the particular methodology has a material adverse effect on investment in rivalrous conduct by the regulated supplier (as opposed to a substantial lessening of competition in a market) then the deterrence is ‘undue’ “ and that “all three legislative requirements would be best met with a common

- 3.2.81 A number of submitters have argued that the application of ACAM would neither deter nor unduly deter investment, and therefore an ACAM approach should be used. The Commission agrees that applying ACAM to regulated services in aggregate neither deters nor unduly deters investment in other services.¹⁷⁸ However, as discussed above, in many circumstances the application of ACAM may not promote cost allocation outcomes consistent with those in workably competitive markets. It cannot be the only approach for a cost allocation IM. ACAM should only be employed in preference to a cost allocation methodology which requires costs to be shared in certain narrowly defined circumstances. This is further discussed in Section 3.3 and Appendix B5.
- 3.2.82 Investment will only be ‘unduly’ deterred in the context of Part 4 if the same investment would not be deterred in a workably competitive market.¹⁷⁹ In other words, if the IM results in an allocation of shared costs consistent with what occurs in workably competitive markets, then decisions not to proceed with particular investments from time to time can be expected. That alone would not indicate that the investment has been unduly deterred.
- 3.2.83 That said, cost recovery (and the implicit allocation that results from it) is dynamic in nature. This flexibility should be reflected in the IM.
- 3.2.84 In particular, it is likely that in a number of instances the regulated services will be allocated a larger proportion of shared costs than unregulated services (both in the short- and the longer-term). However, in the longer-term, all services should bear some allocation of shared costs. Moreover, since the ability to contribute to the recovery of shared costs varies over time the IM needs to be adaptable to the circumstances that may occur in actual markets.¹⁸⁰
- 3.2.85 As set out in Section 3.3, the cost allocation approaches provided as part of the IM have the flexibility to allow for this, and will ensure that investments are not unduly deterred.

3.3 Allocation of Costs under Part 4

- 3.3.1 The IM provides for the following two-step allocation of operating costs and asset values:
- **allocation of costs directly attributable (CDA)**, (i.e. operating costs and asset values that are wholly and solely associated with the provision of

cost allocation IM that does not require any allocation to unregulated services of costs common to regulated services” and recommended that ACAM be specified for regulated services (see Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 1, paragraph 6; p. 38, paragraph 134).

¹⁷⁸ See, for example: PowerNet Limited, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009, p. 3, paragraph 6.6.

¹⁷⁹ This interpretation is also consistent with Vector’s submission to the Select Committee. Vector refers in the submission to a “disproportionate amount” of shared costs—namely that which is “above a level that could be competitively recovered”. (Vector, *Submission on the Review of Parts 4, 4a and 5 of the Commerce Act*, 7 December 2007, p. 17).

¹⁸⁰ For example, the IM needs to allow for situations where a supplier enters an unregulated market where other suppliers are already achieving economies of scope. In these circumstances, competition may have resulted in prices only recovering the incremental cost incurred in the provision of services. Since in such a situation a service cannot contribute to the recovery of shared costs, the IM provides for the OVABAA further discussed in Section 3.3.

electricity distribution, gas distribution or gas transmission services) to the services to which they are directly attributable; and

- **allocation of costs not directly attributable (CnDA)**, (i.e. operating costs and asset values that are associated with the provision of two or more of electricity distribution, gas distribution, gas transmission services or both regulated services and unregulated services in aggregate) to the regulated services they are associated with. This is undertaken based on rules that determine the circumstances in which the application of each of the three approaches set out below is appropriate.¹⁸¹

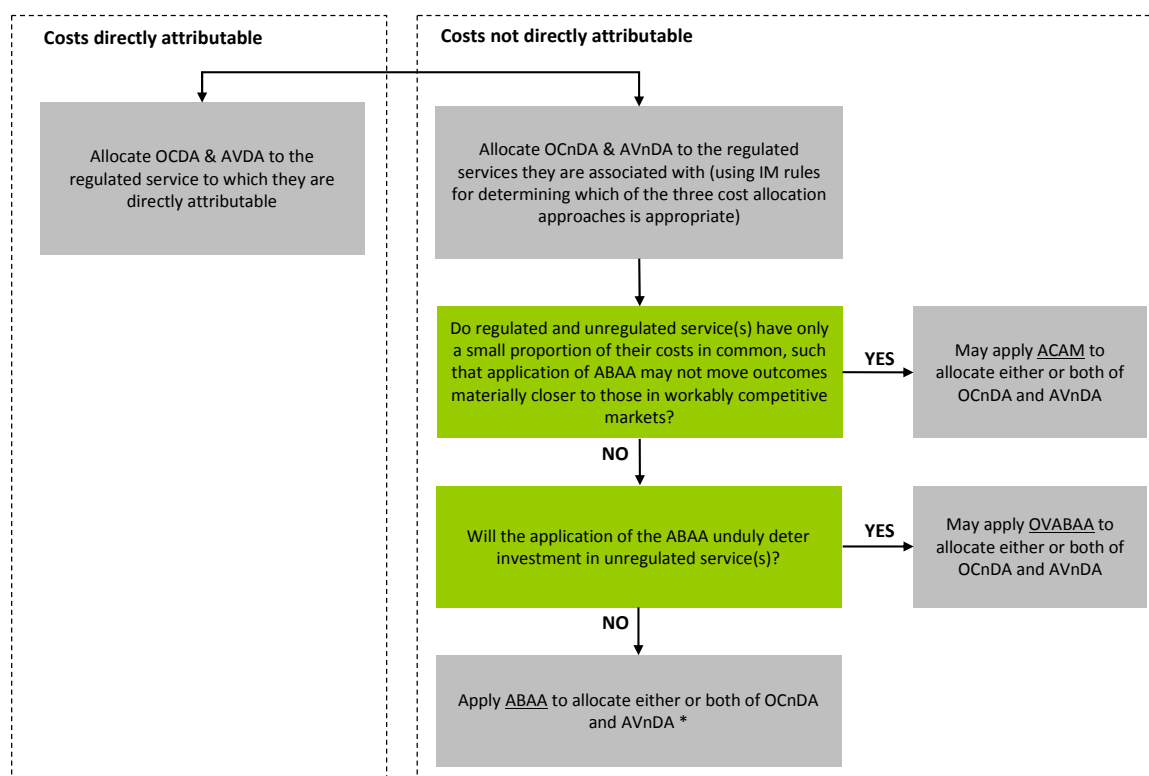
- 3.3.2 Hence, following the allocation of CDA, suppliers must allocate CnDA. The three complementary approaches for the allocation of CnDA are the accounting-based allocation approach, the optional variation to the accounting-based allocation approach, and the avoidable cost allocation methodology.
- 3.3.3 The **accounting-based allocation approach (ABAA)** requires operating costs and asset values to be allocated based on causal factors, or based on proxy factors where causal-based allocators are not available. This approach ensures an allocation of shared costs across all types of services and in many circumstances is expected to move the allocation of shared costs closer to those in workably competitive markets than when applying ACAM, which results in all shared costs being allocated to the regulated services.
- 3.3.4 Use of the **optional variation to the accounting-based allocation approach (OVABAA)** is appropriate in those situations where the application of the ABAA might unduly deter investments in unregulated services. This reflects outcomes produced in workably competitive markets where some services may bear most of the shared costs while others bear little (e.g. during the start-up phase of a new service).
- 3.3.5 Where regulated and unregulated services have only a small proportion of their costs in common, the use of either of the above approaches may not move outcomes materially closer to those in workably competitive markets. This is because, where shared costs are not large, an approach that allocates some shared costs to all services (such as the ABAA) may not produce cost allocation outcomes that are materially different from an approach that allocates shared costs only to certain services. In these instances, suppliers may use the **avoidable cost allocation methodology (ACAM)**, which is based on the implementation of ACAM currently used by many suppliers.
- 3.3.6 The three approaches and the rules for choosing between them reflect the dynamic processes in workably competitive markets and therefore increase the likelihood that outcomes will be consistent with these markets (compared to the current low likelihood of achieving such outcomes using ACAM).

¹⁸¹ Note that as part of the consultation on the Draft IMs and earlier rounds of consultation, the cost allocation process was referred to as cost allocation methodology screening criteria (CAMSC). While the IM does not refer to this term, this change is purely semantic rather than of substance.

- 3.3.7 The IM therefore moves cost allocation outcomes (between two or more regulated services and/or unregulated services) and the efficiency sharing outcomes (between suppliers and consumers of regulated services) closer to those produced in workably competitive markets.
- 3.3.8 Application of the IM determines the way in which efficiencies made through the combined provision of several services are passed on to consumers of regulated services over time.
- 3.3.9 To provide incentives for efficiency, including those that may result from mergers or acquisitions, a DPP and CPP will not be reopened during a regulatory period. This allows suppliers to retain the benefits of efficiency gains for a period. It is also intended that the cost allocation IM be complemented by transparency around cost allocation outcomes provided through monitoring and information disclosure requirements.
- 3.3.10 The allocation of shared costs can have a significant effect on financial results presented under an information disclosure regime, which in turn will affect assessments made by interested persons. The cost allocation methodology standardises the way the allocation of shared costs is carried out for the purposes of information disclosure. This in turn facilitates the assessment of performance by interested persons over time and between regulated suppliers.¹⁸²
- 3.3.11 Figure 3.2 provides an overview of the cost allocation process provided for in the IM, including the process for deciding between the three cost allocation approaches. For a detailed description refer to Appendix B.

¹⁸² As discussed further below, standardisation for the purposes of information disclosure is promoted by applying the rules in the IM.

Figure 3.2 Overview of Cost Allocation Process



Notes: * At any time a regulated supplier may choose to apply ABAA to allocate either or both of OCnDA and AVnDA. OCDA means operating costs directly attributable; AVDA means regulated asset values directly attributable; OCnDA means operating costs not directly attributable; AVnDA means regulated service asset values not directly attributable.

3.3.12 The remainder of this section describes each of the three complementary approaches and the role they play in moving outcomes towards those in workably competitive markets. Further, it provides details on each approach and explains the approaches' effect on efficiency sharing and investment incentives. Finally, the section also discusses the transparency under ID which complements the IM.

3.3.13 For further details on the cost allocation IM, see the following Appendices:

- Appendices B and C provide further details on the cost allocation process for determining which of the three cost allocation approaches should be applied, as well as on other components of the IM;
- Appendix B also provides further details on the application of the IM as part of information disclosure and price-quality regulation; and
- Appendix D provides a worked example that illustrates the application of the three approaches to cost allocation provided in the IM.

Accounting-based allocation approach

3.3.14 In specifying a practical approach to cost allocation that is applied as a process and as rules within EDBs' and GPBs' accounting systems, the Commission has considered the accounting approaches that tend to be used for allocating CnDA in a

regulatory setting and which approach is most appropriate in the context of the Part 4 regulatory regime.¹⁸³

- 3.3.15 Modern approaches to cost allocation in a regulatory context generally use activity-based costing (ABC), which is a variant of fully distributed costing (FDC).¹⁸⁴ An ABC approach allocates costs on the basis of processes that are eventually traced back to outputs. The establishment of causal relationships (using quantitative analysis to develop cost allocators) introduces a level of objectivity to the allocation of costs. However, for some cost categories, the mapping of costs onto processes and outputs may not be possible and therefore an allocation rule based on proxy factors (i.e. simple discretionary rules not based on causality) needs to be used instead.¹⁸⁵
- 3.3.16 The ABAA is an application of ABC. An ABAA that uses cost allocators based on current causal (or proxy) relationships is likely to result in all services bearing a portion of shared costs.¹⁸⁶ As such, in many circumstances it is likely to be consistent with outcomes in workably competitive markets.
- 3.3.17 The Commission recognises that in order to ensure consistency with outcomes in workably competitive markets, the cost allocation IM needs to give EDBs and GPBs sufficient flexibility to reflect changing circumstances in the markets in which their services are provided and therefore suit all suppliers' business models. A range of different causal factors might appear equally valid, yet result in different cost allocation outcomes. For example, the use of pipeline kilometres instead of installation connection points (ICP), to allocate maintenance costs for a GPB may produce different allocations of shared costs where customer density varies across different parts of the network.
- 3.3.18 Suppliers have provided a number of specific comments on the appropriate level of prescription. In particular, a number of suppliers submitted that a cost allocation approach based on broad principles is preferable to a more prescriptive approach.¹⁸⁷ (Refer to the Draft Reasons Paper for a discussion on this).¹⁸⁸
- 3.3.19 There is a balance to be struck between the different reasons for and against certain level of prescription, including the need to fit suppliers' circumstances and the cost of compliance.

¹⁸³ Although allocations produced as a result of applying accounting processes and rules may not be fully efficient, when specified appropriately they are likely to promote outcomes consistent with those produced in workably competitive markets.

¹⁸⁴ The IM Discussion Paper discusses several possible accounting-based approaches to allocating costs (Commerce Commission, *Input Methodologies Discussion Paper*, 19 June 2009, pp. 105-107).

¹⁸⁵ The information required to allocate costs under the IM is already likely to be available from the accounting systems currently used by many EDBs and GPBs to provide information for management purposes and/or to implement ACAM. Some initial set-up cost may be required, however, for modifications and/or extensions to these systems to ensure that they comply with the IM.

¹⁸⁶ See Appendix B4 for a discussion of causal and proxy relationships.

¹⁸⁷ See, for example: Vector, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 11, paragraph 46; Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 20 August 2010, p.26, paragraph 91

¹⁸⁸ Commerce Commission, *Input Methodologies (Electricity Distribution Services) Draft Reasons Paper*, 18 June 2010, pp. 72-74, paragraphs 3.3.34-3.3.39.

- 3.3.20 International experience highlighted by Dr Michael Pollitt demonstrates the potential pitfalls of a lack of standardisation.¹⁸⁹ On the other hand, transparency can be more important than a high level of standardisation of data as highlighted by Professor George Yarrow.¹⁹⁰
- 3.3.21 The Commission considers a greater level of prescription is not appropriate at this time. As stated above, it is important that the IM affords sufficient flexibility to suppliers to adequately reflect their own business models in cost allocations made. However, as discussed in paragraphs 3.3.47 to 3.3.52, the transparency provided through cost allocation disclosure and monitoring requirements will provide interested persons with information about how regulated suppliers are allocating their costs. This information will also be available to the Commission when it reviews the cost allocation IM (as required by s 52Y(1)) and determines whether the current balance between flexibility and prescription remains appropriate.
- 3.3.22 The ABAA, therefore, does not prescribe cost or asset allocators for particular operating cost line items or assets and by providing flexibility over the choice of these allocators, suppliers will be able to implement the ABAA in a way appropriate to their particular circumstances. This will limit the potential for arbitrary cost and asset allocators to move allocation outcomes further away from those produced in workably competitive markets than is currently achieved through the application of ACAM. However, the IM defines the meaning of a causal relationship which, as discussed above, is a key concept when implementing the ABAA (refer to Appendix B4).

Efficiency sharing under the different regulatory instruments

- 3.3.23 The ABAA provides for shared costs to be allocated between services and for this to be undertaken on the basis of causal relationships where possible. The methodology therefore provides for the sharing of the benefits of efficiency gains (to the extent that allocations are reflected in price) with consumers of regulated services. In many situations this results in outcomes consistent with those produced in workably competitive markets.
- 3.3.24 The sharing of the benefits of efficiencies between suppliers and consumers to promote outcomes as required by s 52A(1)(c), occurs as a result of the application of the IM under the regulatory instruments.
- 3.3.25 Under information disclosure, there is no formal mechanism for passing on benefits from efficiency gains. Where efficiencies relating to economies of scope are achieved, the information made available will assist interested parties in assessing whether the benefits of those efficiencies are being passed on to consumers and hence whether the Part 4 Purpose is being met.
- 3.3.26 For suppliers subject to price-quality regulation, efficiency gains will result in suppliers outperforming the price path, i.e. the revenue allowance set under the DPP

¹⁸⁹ Dr Michael Pollitt, *Expert Review of the New Zealand Commerce Commission's Draft Decisions and Reasons for Specified Airport Services*, page 4.

¹⁹⁰ Professor George Yarrow, *Review of Input Methodologies (Electricity Distribution Services and Gas Pipeline Services) Draft Reasons Paper*, page 8.

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- or CPP price paths provides for a level of costs greater than the costs actually incurred by the supplier.
- 3.3.27 Such efficiencies may be achieved, for example, through economies of scope resulting from mergers or acquisitions involving other services regulated under Part 4.
- 3.3.28 Following a merger or acquisition part-way through a regulatory period, under the IMs suppliers are not required to reallocate their costs and reflect any changes in shared cost costs in their prices (e.g. by re-opening their price path). For transparency, however, suppliers must report their actual costs as part of information disclosure. The effect of this is that suppliers may retain any benefits from efficiencies resulting from the transaction, since they may ‘double count’ costs and hence recover the shared costs more than once from consumers of regulated services. The ability to retain these gains provides the incentive to achieve these efficiencies, consistent with s 52A(1)(c).¹⁹¹ At the end of the regulatory period the Commission resets the price path through starting price adjustments under a DPP or a new CPP.¹⁹² Through this the benefits from efficiency gains made in the previous period are shared with consumers. If efficiencies are not achieved until the next regulatory period, or additional efficiencies are made in subsequent periods these would be passed on in subsequent resets.¹⁹³
- 3.3.29 There are also some instances where a significant period of time has passed since the completion of a merger or acquisition, i.e. those which have occurred prior to the commencement of the Part 4 regime in October 2008. In these instances (assuming that suppliers have used ACAM to allocate costs) suppliers have benefited from the retention of efficiencies for a considerable period.¹⁹⁴ Submitters acknowledged that costs should be allocated between two types of regulated services in a manner that ensures that efficiencies are passed on to consumers of regulated services (refer also to Chapter 8).¹⁹⁵
- 3.3.30 Further discussion on the application of the IM as part of DPPs and CPPs is provided in Appendix B.

¹⁹¹ Submitters agreed with this approach and argued that following a merger or acquisition involving two suppliers of regulated services, some double counting of costs is appropriate in the short-run. See, for example: Orion New Zealand Limited, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009, pp. 16-17, paragraphs 58-61 and Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper*, 13 August 2010, p. 36, paragraph 141.

¹⁹² In addition, the application of IRIS under a CPP ensures that the incentives to achieve efficiencies are equal across a regulatory period. See Chapter 8 for a discussion of this.

¹⁹³ Vector and Synergies on behalf of Vector submitted that “the Commission has failed to set a reasonable timeframe for the benefits to be retained by suppliers and then shared with consumers (see Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper*, 13 August 2010, pp. 36-37, paragraphs 141-146 and Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper, Attachment: Synergies Economic Consulting Response to Commerce Commission’s Input Methodologies Draft Reasons papers - Cost Allocation*, August 2010, pp. 41-44, paragraph 3.7). The time period over which sharing occurs is determined by a combination of IRIS (for CPPs) and the reset of the price-quality path based on actual rather than expected costs (for DPPs).

¹⁹⁴ As further discussed in Appendix B5, the application of ACAM to each type of individual regulated service results in shared costs being recovered more than once (i.e. by costs being double or triple counted) from consumers of regulated services.

¹⁹⁵ See, for example: PricewaterhouseCoopers made on behalf of 19 Electricity Distribution Businesses, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009, p. 26, answer to question 29.

Optional variation to the accounting-based allocation approach

- 3.3.31 While the ABAA offers significant flexibility to regulated suppliers, there are instances where the mechanistic application of such an approach might lead to allocations that differ from those in workably competitive markets. The ABAA is not able to mirror the dynamic nature of the implicit cost allocations achieved through the market mechanism. For example, in the short-term existing services may recover most or all shared cost on behalf of a new service until this service is able to increase its contribution to the recovery of shared costs.
- 3.3.32 The application of the ABAA alongside the provisions enabling the retention and sharing under price-quality paths provides suppliers with incentives to innovate and invest in regulated services. However, there might be instances where the application of this approach will result in suppliers' deciding to discontinue existing services or not to undertake investments in new unregulated services. In such instances, costs the services are required to bear (and are recovered through prices) as a result of the ABAA may unduly deter investments in unregulated services.
- 3.3.33 In these situations, the OVABAA provides a process and allocation which avoids undue deterrence and enables unregulated services to evolve in a way which is consistent with outcomes produced in workably competitive markets. As also noted by Professor George Yarrow:
- [...] it could be disproportionate to insist on common cost allocations at the start-up of an unregulated business activity, not only because the level of activity may not warrant the transactions costs that might be incurred, but also because it is not unusual for an established infrastructure supplier to offer discounts early on that would encourage the development of the new business, in the hope/expectation of achieving higher revenues later, when the business has grown in size.¹⁹⁶
- 3.3.34 The OVABAA gives EDBs and GPBs the option to achieve a greater recovery of shared costs from regulated services in the short- (and possibly longer-) term than might be achieved through the ABAA.¹⁹⁷ To achieve this allocation, suppliers already need to have undertaken an initial allocation of costs using the ABAA.
- 3.3.35 To do this, suppliers first need to form a view on the viability of their current unregulated service(s) based on factors such as prices, demand, quality etc. This assessment can then be used to justify moving away from the initial cost allocation on the grounds that, if one or more of the unregulated services had to bear the costs implied by such an approach, existing services would be discontinued and/or new services would not be provided, solely due to the application of that approach.
- 3.3.36 The OVABAA therefore allows suppliers to take into account the same types of factors that in workably competitive markets might lead to some services bearing a lower allocation of shared cost in the short-term than they would in the longer-term.

¹⁹⁶ Professor George Yarrow, *Review of Input Methodologies (Electricity Distribution Services and Gas Pipeline Services) Draft Reasons Paper*, July 2010, p. 8.

¹⁹⁷ Vector suggested that when a directors' certification is made ACAM should be applied (Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 35, paragraph 132). As discussed in paragraph 3.2.81, an ACAM outcome is not the allocation that the Commission would generally expect to be consistent with the objective of not unduly deterring investments. Rather, application of the OVABAA allows for a combination of different allocation outcomes to be applied if deemed necessary by directors and may result in an allocation between ABAA and ACAM.

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- 3.3.37 In determining an allocation that does not unduly deter investment a significant amount of information is likely to be required. The Commission considers that suppliers' understanding of their own business places them in the best position to judge the level of allocation of shared costs which does not unduly deter investments.
- 3.3.38 There is an inherent information asymmetry between suppliers and the Commission as regards to this allocation. To address information asymmetry in a cost effective way, suppliers are required to provide a directors' certificate on the appropriateness of the allocation. Suppliers also have to comply with information disclosure and monitoring requirements. The directors' certification approach avoids the need to specify criteria in the IM which may not be sufficiently flexible to deal with the different circumstances that might arise in practice.
- 3.3.39 All cost allocations made using the OVABAA will be subject to information disclosure and monitoring requirements which will result in scrutiny of these allocations over time.¹⁹⁸ The Commission has not specified formal criteria for determining the extent to which individual investments are deterred. However, it will monitor both certifications made and information provided as evidence on an ongoing basis. Should the Commission find that the certification process is not working as effectively as intended, it could always review this aspect of the IM, along with other matters, when it undertakes its review of IMs within the next seven years.
- 3.3.40 The OVABAA relies on suppliers' understanding of their unregulated services and, based on this, directors' judgements at a given point in time regarding the proportion of shared costs that can be allocated to (and be reflected in prices set to recover costs of) unregulated services without unduly deterring them. This ensures consistency with outcomes in workably competitive markets in the short-run. It does raise the issue, however, as to how efficiencies associated with the combined provision of regulated and unregulated services are shared with consumers of regulated services over the longer-term.
- 3.3.41 In workably competitive markets the transition from short- to longer-term outcomes, including the proportion of costs recovered through prices or the decision to discontinue a service, tends to be a gradual process and the time required for the transition varies. The IM therefore also relies on directors' judgement as to the speed at which the level of cost allocated to unregulated services changes over time. In practice, where suppliers are subject to price-quality regulation, these changes will affect price-quality paths at DPP/PPP price resets. However, the exact speed at which this occurs involves directors considering on an annual basis whether the extent to which investments are unduly deterred has changed.

¹⁹⁸ The Commission also considered whether it should develop criteria for assessing whether investments are unduly deterred and how services' ability to bear costs changes over time. However, due to the likely significant variations between different investments in the duration of the transition from the short- to the longer-term, such a test would likely be inaccurate and hence would not necessarily promote outcomes consistent with those in workably competitive markets.

ACAM

- 3.3.42 In instances where the level of shared costs between regulated and unregulated services is relatively small, the use of one of the above approaches may not move outcomes materially closer to those in workably competitive markets than those achieved using an approach which allocates all shared costs to the regulated services. In these instances, suppliers may use ACAM, which is based on the implementation of ACAM currently used by many suppliers.¹⁹⁹
- 3.3.43 The Commission has developed a set of materiality thresholds that assess whether cost allocation outcomes are likely to be moved materially closer to outcomes consistent with those in workably competitive markets. These tests are applied by suppliers and are based on readily available data. In instances where suppliers' revenues, operating costs and/or asset values do not reach or exceed these thresholds, these suppliers are not required to implement an ABAA and instead may apply ACAM.²⁰⁰ For more details on the materiality tests that form part of the IM see Appendix B3.

Treatment of arm's length transactions

- 3.3.44 A mandated cost allocation process is not the only mechanism that may produce cost allocation outcomes consistent with those in workably competitive markets. Suppliers may also clarify their cost allocation policies more directly through their own operational practices.
- 3.3.45 For instance, EDBs or GPBs may undertake transactions between regulated and unregulated services or between different types of regulated services which can be considered to be arm's-length, i.e. transactions which represent outcomes which fully independent parties would have agreed upon after a negotiation process. Such outcomes can be achieved through parties actually being independent or, where some dependency exists, by putting rules in place which replicate arm's-length outcomes. Such arm's-length transactions can lead to a shared cost recovery similar to outcomes produced in workably competitive markets.
- 3.3.46 The definition of 'arm's-length' and further details relating to adjustments of arm's-length transactions are set out in Appendix B7.

Role of transparency

- 3.3.47 Flexibility in the application of the IM potentially leads to less consistency between suppliers and across time periods in the allocation of costs. However, transparency in cost allocation disclosures required under information disclosure can compensate for this. For example, to the extent that cost allocators and cost line items are transparently disclosed, the Commission and other interested persons will be able to

¹⁹⁹ Notwithstanding this, suppliers may wish to develop the accounting systems required to implement other cost allocation approaches regardless. Experience shows that regulated companies themselves may find that information provided by accounting systems enhanced for regulatory purposes is valuable for internal operational purposes. See, for example: Mr. Verster representing Vector, *Input Methodologies, Opex/Capex Requirements for CPP Proposals Workshop Transcript*, 31 March 2010, pp. 8-13.

²⁰⁰ This allocation is subject to the constraint that the allocation to the regulated services must be no higher than that resulting from ACAM applied to those services in aggregate.

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- understand the differences in disclosures made by different regulated suppliers and factor it into comparisons.
- 3.3.48 Greater transparency may help to improve the consistency of allocations (i.e. the consistency between different EDBs and GPBs, and within suppliers over time) as it is likely to bring with it greater scrutiny from interested persons.
- 3.3.49 While comparisons between regulated suppliers may provide valuable insights, the assessment of trends in performance of each supplier over time will also assist interested persons in assessing whether the Part 4 Purpose is being met. It would also, however, be desirable for the IM to promote consistency and comparability in the disclosure of financial information over time in relation to various regulated services.²⁰¹
- 3.3.50 Application of the IM through ID requires that disclosures relating to cost allocation be made by suppliers. Such information will assist in setting price-quality paths and interested persons in assessing whether the Part 4 Purpose is being met. Where changes in definitions or practices are undertaken, the ID Determination is likely to require additional disclosures that set out the effect these changes have on information provided.
- 3.3.51 Appendices B8, D4 and D5 provide further detail on the types of information that is likely to be required by the Commission as part of information disclosures. They also set out further detail on the types of information likely to be required by the Commission for the purposes of monitoring compliance with the cost allocation IM pursuant to s 53ZD.
- 3.3.52 Appendix B8 also provides further detail on the points at which cost and asset allocations should be carried out for the purposes of forecasts within CPP applications. The IM provides that in most circumstances any changes to the other types of services since the most recent application of the cost allocation IM should have no effect on the allocation of costs or assets going forward. Forecasts of operating costs must therefore be consistent with an allocation of these costs carried out at the end of the disclosure year in which the ID disclosure was made and calculations of RAB values must also be based on allocations of assets made at that time.

²⁰¹ Commerce Commission, *Input Methodologies Discussion Paper*, 19 June 2009, pp. 99-100, paragraph 5.37.

CHAPTER 4: VALUATION OF ASSETS

4.1 Introduction

4.1.1 The IMs relating to regulated electricity lines and gas pipeline services must include methodologies for determining the “valuation of assets, including depreciation and treatment of revaluations” (s 52T(1)(a)(ii)). The matters covered in the IM for the valuation of assets include:

- establishment of the initial regulatory value of each supplier’s asset base;
- revaluation of assets in the future;
- calculation of depreciation; and
- treatment of asset acquisitions and disposals.

4.1.2 The reasoning for the Commission’s decisions in relation to these matters is explained in this chapter and/or the accompanying appendices.

IM for the valuation of assets

4.1.3 For most businesses, the value of an asset depends on its expected profitability, which—in a workably competitive market—is constrained by competition. In regulated markets, however, there is little or no competition and little or no likelihood of a substantial increase in competition. The unconstrained profitability of a regulated supplier would consequently be an inappropriate reference point for establishing an asset value to be used for assessing returns, or for setting regulated prices, since it would be based on, and lead to, future monopoly pricing.

4.1.4 Regulatory asset values must instead be based on an alternative approach to valuation. Rather than *reflecting* the profits that a supplier expects to earn, the valuation of assets will help *determine* the supplier’s profit expectations. In other words, in a regulatory context, the usual link between asset values and profitability is reversed.

Application of the IM for the valuation of assets

4.1.5 There are two main ways in which regulatory asset values apply to price setting and price monitoring. First, the values provide the basis for determining the return *of* capital required by suppliers in each period (i.e. to cover depreciation in asset values). Secondly, they are used in conjunction with an estimate of the supplier’s cost of capital—expressed in percentage terms—to determine the return *on* capital that suppliers require to cover their financing costs in dollar terms. These elements together, the required return *on* and *of* capital, are known as a supplier’s capital costs.²⁰²

²⁰² References to the ‘cost of capital’ in this IM and in general relate to the estimate of the required return *on* capital. The term ‘capital costs’ covers both the return *on* and return *of* capital.

- 4.1.6 As discussed in Chapter 2, regulatory asset values—and the capital costs that they imply—then help to determine, along with the other elements of the regulatory regime, the revenues that a supplier can expect to be:
- able to earn under information disclosure regulation before profits appear excessive, and/or
 - allowable under default/customised price-quality regulation (i.e. when price-quality paths are set).
- 4.1.7 The same valuation will be used interchangeably for both of these functions under Part 4.

Overview of IM and structure of this chapter

- 4.1.8 Table 4.1 sets out the components of the IM for the valuation of assets for EDBs and GPBs, and indicates where in this paper each component is discussed.

Table 4.1 Overview of the Asset Valuation IM

Approach in IM	Where Discussed
<p>EDBs and GPBs must establish their initial RAB values from existing regulatory valuations, namely:</p> <ul style="list-style-type: none"> • the regulatory asset values disclosed in 2009 in accordance with applicable information disclosure requirements; or • in the case of assets that are subject to the Gas Authorisation, the RAB values determined under the Gas Authorisation as at 30 June 2005, updated to the financial year ending in 2009 for capital expenditure, depreciation and CPI-indexation. 	Section 4.3
<p>EDBs and GPBs to adjust their initial RAB values to:</p> <ul style="list-style-type: none"> • correct for known errors in asset registers, with respect to the application of valuation approaches under existing information disclosure requirements (with the exception of assets covered by the Gas Authorisation); • make adjustments to ensure that assets included in the initial RAB values align with the definitions of electricity lines services and gas pipeline services provided for in sections 54C and 55A of the Commerce Act; • in the case of EDBs: <ul style="list-style-type: none"> ○ adjust the application of multipliers in their 2004 ODV valuations where better information has become available since 2004 (including revised ranges and application for some multipliers); ○ reapply the optimisation and economic value tests set out in the 2004 ODV Handbook, with respect to assets where an optimisation or economic value adjustment in 2004 led to either a full or partial write-down; ○ ensure finance during construction (FDC) costs are accounted for in establishing the initial RAB value of assets; and • in the case of Vector’s NGC Distribution and NGC Transmission assets, adjust the value to provide for CPI indexation from the first day of the disclosure year 2006. 	Appendix E, Section E2

Approach in IM	Where Discussed
EDBs and GPBs must roll forward the RAB values of their assets using CPI-indexation. For this purpose EDBs and GPBs must use the ‘All Groups Index SE9A’ published by Statistics New Zealand.	Section 4.3; Appendix E, Section E12
<p>EDBs and GPBs should exclude from their RAB values:</p> <ul style="list-style-type: none"> • as applicable, any assets not used to provide electricity lines services (as defined by s 54C) and any assets not used to provide gas pipeline services (as defined by s 55A); • any asset that is part of a works under construction; • working capital; • goodwill; and • easement land, that is land acquired for the purpose of creating an easement and with the intention of subsequently disposing of the land. 	<p>Appendix E, Section E2</p> <p>Appendix E, Section E5</p> <p>Appendix E, Section E3</p> <p>Appendix E, Section E3</p> <p>Appendix E, Section E6</p>
EDBs and GPBs may include in their RAB values finance leases and intangible assets provided that they are identifiable non-monetary assets that are not goodwill, consistent with the meanings under GAAP. EDBs and GPBs must establish the value of permitted intangible assets added to the RAB value after the last day of the disclosure year 2009 using the cost model for recognition under GAAP. ²⁰³	Appendix E, Section E3
EDBs and GPBs should include capital additions in their RAB values at cost in the year in which the asset is ‘commissioned’, that is when the asset is first used by the regulated supplier to provide electricity distribution services/gas pipeline services. When a regulated supplier disposes of an asset the closing RAB value of that asset, for the disclosure year in which the disposal occurs, is nil.	Appendix E, Section E4
<p>EDBs and GPBs should include network spares in the roll forward as additions to the RAB value where they are:</p> <ul style="list-style-type: none"> • treated as the cost of an asset under GAAP (wholly or in part); and • held in appropriate quantities, considering the historical reliability of the equipment and the number of items installed on the network. 	Appendix E, Section E4
EDBs and GPBs must include new easement rights in the RAB value at cost in the year in which the rights are acquired, provided that the RAB value of new easement rights does not exceed fair market value, as determined by an independent valuer.	Appendix E, Section E6
EDBs and GPBs must recognise capital contributions by adding the asset in question to the RAB value at cost (measured in accordance with GAAP), reduced by the amount of the capital contribution received (where the capital contribution does not reduce the cost of the asset under GAAP).	Appendix E, Section E7
EDBs and GPBs must include vested assets in the RAB value at the cost to the supplier, consistent with GAAP, provided that the RAB value does not exceed the amount of consideration paid by the regulated supplier in respect of the asset.	Appendix E, Section E7

²⁰³ See accounting standard NZ IAS 38, paragraph 24.

Approach in IM	Where Discussed
<p>EDBs and GPBs must remove assets recognised as lost from the RAB value in the year in which they are identified as lost, and must reduce the RAB value by the asset's opening RAB value in that year. Once the initial RAB value has been established, lost assets that were in the initial RAB will be permitted to remain in the RAB value.</p> <p>Once the initial RAB value has been established found assets are limited to assets commissioned after the 2009 disclosure year. Regulated suppliers must add found assets to the RAB in the year in which they are found, and must establish the RAB value of found assets at cost, consistent with GAAP, where sufficient records exist. Where sufficient records do not exist, regulated suppliers may assign the asset the same value as a similar asset in the RAB (where such an asset exists). If no such similar asset exists, regulated suppliers must use the asset's market value as verified by an independent valuer.</p>	<p>Appendix E, Section E9</p>
<p>Where an EDB or GPB purchases an asset from another regulated supplier it must add the asset to its RAB value at the asset's equivalent value in the RAB of the seller.</p> <p>Where an EDB or GPB purchases an asset from a related party (that does not supply services that are regulated under Part 4), it must add the asset to its RAB at depreciated historic cost where documentation is available to support this. Where sufficient records do not exist to establish depreciated historic cost, it must use the asset's market value as verified by an independent valuer. For this purpose a related party includes both:</p> <ul style="list-style-type: none"> • business units of the same EDB and GPB that supply services other than electricity transmission services; and • a party that under GAAP is considered a related party (including any party that has conducted business either directly or indirectly with the supplier in the current financial year). 	<p>Appendix E, Section E8</p>
<p>EDBs and GPBs subject to default/customised price-quality regulation must capitalise financing costs on works under construction in accordance with GAAP, at a rate no greater than the 75th percentile for the regulatory post-tax WACC determined under the cost of capital IM, for the purpose of information disclosure and CPPs.</p>	<p>Appendix E, Section E5</p>
<p>Exempt EDBs must capitalise financing costs on works under construction in accordance with GAAP, at a rate no greater than their own estimate of their cost of capital.</p>	<p>Appendix E, Section E5</p>
<p>When they commission works under construction EDBs and GPBs must reduce the cost of the asset, established consistent with GAAP, by the amount of any revenue derived in relation to the assets while they were works under construction (where such a reduction is not already made under GAAP, and where the revenue has not already been reported as income under information disclosure).</p>	<p>Appendix E, Section E5</p>

Approach in IM	Where Discussed
<p>EDBs and GPBs must depreciate assets in their RAB using straight line depreciation.</p> <p>Regulated suppliers subject to default/customised price-quality regulation may apply to use an alternative depreciation approach under a CPP.</p> <p>Total (unallocated) depreciation over the lifetime of the asset must not exceed the value at which the asset is first recognised in the RAB under Part 4 (after adjusting for the effects of revaluations).</p> <p>Regulated suppliers may not depreciate land and easements (other than fixed life easements).</p>	<p>Appendix E, Section E10</p>
<p>EDBs and GPBs must use the standard asset lives in Schedule A of the IM Determination, with the following exceptions:</p> <ul style="list-style-type: none"> • EDBs and GPBs must depreciate fixed life easements over the expected term of the easement; • For dedicated assets, EDBs and GPBs may assign an asset life equal to the life of the supporting customer contract; • EDBs and GPBs may extend asset lives beyond those provided in the list of standard physical asset lives, and set asset lives for refurbished assets, without an independent engineer's report; • EDBs and GPBs may reduce an asset life, provided the reduced asset life is supported to an independent engineer's report; • EDBs and GPBs must determine when to commence depreciating network spares consistent with GAAP; • Where EDBs and GPBs add a found asset to the RAB, and where an EDB's or GPB's RAB already contains a similar asset, the asset life of the found asset should be the asset life applying to the similar asset. <p>For assets commissioned in the future that are not covered by the list of standard physical asset lives, regulated suppliers must establish physical asset lives as follows:</p> <ul style="list-style-type: none"> • where an asset of the same type is already in the RAB, using the same asset life as assigned to the existing asset; and • otherwise, by setting an asset life for the asset supported by an independent engineer's report. <p>For assets in the initial RAB value, the physical asset life will be the asset's existing remaining life as at the balance date for each EDB's or GPB's 2009 disclosures.</p> <p>Where an asset comprises a number of components with differing lives (a 'composite asset'), EDBs and GPBs must calculate the total asset life for the composite asset as a weighted average of the lives of those components.</p> <p>For the purpose of CPP proposals, no system fixed assets should be forecast to be written off during a regulatory period. All such assets in service at the start of a CPP regulatory period are deemed to have a physical asset life equal to the duration of the CPP period.</p>	<p>Appendix E, Section E10</p>
<p>Where demand for the asset falls away, regulated suppliers may retain the asset in the RAB value for the purpose of information disclosure, and continue to depreciate the asset over its remaining asset life.</p>	<p>Appendix E, Section E11</p>

Approach in IM	Where Discussed
Regulated suppliers must record the total (i.e. ‘unallocated’) value of an asset in the asset base and roll it forward (for depreciation, revaluations, additions etc.) on an unallocated basis. The cost allocation IM is applied to this asset value whenever it is necessary to determine a specifically attributable (i.e. ‘allocated’) portion of the asset value for regulated activities (for example to calculate depreciation and revaluations).	Appendix E, Section E13

4.1.9 The structure of the chapter is as follows:

- Section 4.2—Key considerations in determining the IM for the valuation of assets. This section outlines:
 - the variety of valuation approaches that have been discussed during consultation (paragraphs 4.2.3 - 4.2.9); and
 - the insights that can be derived from workably competitive markets in relation to the IM for the valuation of assets (paragraphs 4.2.10 - 4.2.26)
- Section 4.3—Valuation of assets under Part 4. This section:
 - explains why having regard to existing regulatory valuations when establishing the initial value of specialised assets under Part 4 is the appropriate approach (paragraphs 4.3.1 - 4.3.13);
 - summarises the main reasons why submitters consider that it would be better to rely on new replacement cost-based valuations to establish initial values (paragraphs 4.3.14 - 4.3.20);
 - provides the Commission’s responses to each of the main themes raised by submitters in relation to the way that the initial value is established (paragraphs 4.3.21 - 4.3.65); and
 - explains the way in which the initial value is to be updated year-on-year, including responses to key submissions on this topic (paragraph 4.3.66 - 4.3.88).

4.1.10 There are two appendices to this chapter:

- Appendix E provides more detail on specific components of the IM for the valuation of assets; and
- Appendix F addresses the issues that have been raised by EDBs and GPBs concerning the existing regulatory valuations.

4.2 Key Considerations in Determining the Asset Valuation IM

4.2.1 The decisions in association with the valuation of assets can be thought of in two related parts. First, the ‘initial’ value of the Regulatory Asset Base (the RAB) must be established at the start of the new Part 4 regime; secondly, these RAB values must be ‘rolled forward’ over time (i.e. updated year-on-year). Both these elements of the asset valuation exercise must be determined in accordance with the relevant

statutory requirements: the purpose of IMs (paragraphs 2.2.4 - 2.2.6 in Chapter 2) and the Part 4 Purpose (paragraphs 2.4.1 - 2.4.8 in Chapter 2).

- 4.2.2 During consultation on the IM for the valuation of assets, the primary point of difference between the Commission and submitters has centred on the extent and nature of the guidance provided by the Part 4 Purpose. Before turning to the issues in detail in Section 4.3, this section provides the context for that debate (paragraph 4.2.3 - 4.2.9), and sets out the core insights from workably competitive markets that have guided the Commission's decision making (paragraphs 4.2.10 to 4.2.26).

Valuation approaches discussed during consultation on IMs

- 4.2.3 Determining an appropriate level of remuneration in the future for capital investments regulated suppliers have made in the past (i.e. for existing assets) is problematic. This is determined by the 'initial RAB value'. Establishing the initial RAB value is a particularly contentious task where it is undertaken midway through the lives of assets that were previously unregulated, or regulated under a different regime.
- 4.2.4 The significance of the valuation task should not be underestimated. Since higher regulatory valuations result in a higher level of capital costs in future, the higher the valuation, the higher the prices a business would be allowed to charge under regulation, and the greater its future revenues. The converse applies to lower valuations.
- 4.2.5 There is no international 'best practice' or 'standard' approach when establishing initial RAB values, as recognised by some submitters during consultation. At the conference on the IM Discussion Paper, for example, Jeff Balchin of PwC (appearing at the request of Powerco) noted that "economic efficiency at best gives you a range for valuations, and within that a reasonably insoluble problem".²⁰⁴
- 4.2.6 As discussed in paragraphs 4.2.18 - 4.2.26, all of the various accounting-based valuation approaches that have been discussed during consultation—and which are summarised in Table 4.2 below—are conceivably consistent with promoting outcomes consistent with outcomes produced in workably competitive markets. The same can also be said of valuations that are consistent with existing regulatory arrangements. These have been prepared on the basis of a combination of these valuation approaches and represent the current basis upon which interested persons can assess the profitability of EDBs and GPBs.

²⁰⁴ Mr. Balchin of PwC (appearing at the request of Powerco), Input Methodologies Conference Transcript, p. 206, lines 3-30.

Table 4.2 Accounting-based Approaches to the Valuation of Assets

Type of Approach	Key Elements	Specific Valuation Techniques
Historic cost-based approaches	<ul style="list-style-type: none"> Based on the original cost of construction and installation. These values may be adopted with or without indexation applied from the date at which the assets were installed. The values are depreciated using either an ‘actual’ or ‘assumed’ depreciation schedule. 	<p>Depreciated Actual Cost (DAC)</p> <ul style="list-style-type: none"> ‘Actual depreciation’ is calculated on the basis of the depreciation previously recovered (or believed to have been recovered) from consumers. <p>Depreciated Historic Cost (DHC)</p> <ul style="list-style-type: none"> ‘Assumed depreciation’ is calculated on the basis of an accounting-based depreciation schedule—such as straight-line depreciation. No indexation is applied. <p>Indexed Historic Costs (IHC)</p> <ul style="list-style-type: none"> Assumed depreciation is used and indexation is applied.
Replacement cost-based approaches	<ul style="list-style-type: none"> Based on the cost of replacing the entire network with assets of similar service potential (i.e. Modern Equivalent Assets, or ‘MEAs’). Some form of ‘optimisation’ may be applied when assessing these costs to reflect changes in the required deployment, modernity and scale of the assets to achieve the same level of services as supplied by the existing assets. Optimisation can range from the elimination of surplus assets at one end of the spectrum, to the complete redesign of the network at the other. Depreciation, if applied, is usually ‘assumed’; it is not based on ‘actual’ depreciation charged to consumers in the past. 	<p>Depreciated Replacement Cost (DRC)</p> <ul style="list-style-type: none"> Depreciation is calculated based on the remaining service potential of the asset (i.e. based on remaining asset lifetimes). Assumptions are required on the likely costs of replacing each class of asset(s) and the type of depreciation that should be applied. <p>Optimised Depreciated Replacement Cost (ODRC)</p> <ul style="list-style-type: none"> Similar to DRC, but also requires assumptions around the appropriate form of optimisation to apply. <p>Optimised Replacement Cost (ORC)</p> <ul style="list-style-type: none"> No depreciation is applied because ORC assumes only new assets are installed. <p>Optimised Deprival Value (ODV)</p> <ul style="list-style-type: none"> Initially developed for use in insurance and damages estimation. Often described as being equal to the ‘loss to the owner’ if they were deprived of their assets and then took action to minimise their loss. Valuation outcomes are the same as for ODRC, except where it would not be rational from an economic perspective to replace the asset (or group of assets) with modern equivalents. In these cases, the valuation is based on the greater of scrap value or the unconstrained potential profitability of the assets (the valuation that is greater is known as the asset’s Economic Value (or EV)).

4.2.7 In the view of most regulated suppliers, however, it would not be appropriate to have regard to existing valuations when establishing initial values under Part 4. They consider new replacement cost-based valuations are required instead. Amongst other reasons:

- some submitters have argued that the reference to workably competitive markets in the Part 4 Purpose strongly implies that asset values should be determined on the basis of a replacement cost-based approach carried out at the inception of Part 4; while
- others consider that the Commission made a commitment under previous regulatory arrangements that a new replacement cost-based valuation would be undertaken in 2008.

4.2.8 New replacement cost-based valuations would be likely to lead to substantial increases in asset values for each regulated supplier. For example, EDBs have provided the Commission with a handbook that sets out the specification of the ODV approach that they favour.²⁰⁵ It is clear from this handbook that increases in replacement costs have been very strong in recent years.²⁰⁶

4.2.9 The approach used in future to value investments, and the rate at which investments should be recovered, is generally a less contentious issue.²⁰⁷ This is because—unlike the initial valuation—the alternatives that are available are generally equivalent in Net Present Value (NPV) terms.²⁰⁸ It is also possible to achieve a shared understanding about the rules that will apply in advance. Notably, the majority of regulators of gas pipeline and electricity lines services in the US, UK and Australia currently use an historic cost-based approach to roll forward regulatory values once they have been established initially. Most submitters agreed that an historic cost-based approach should be used in future, although they did not all support an indexed approach (paragraphs 4.3.71 - 4.3.84 below).

Insights from workably competitive markets

4.2.10 The reference to workably competitive markets in the Part 4 Purpose is clearly relevant to the valuation of assets under Part 4. By way of context, the remainder of this section outlines the factors that influence asset values in workably competitive markets.²⁰⁹

²⁰⁵ ENA, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: PricewaterhouseCoopers, SKM ODV Handbook Report: prepared for Electricity Networks Association, 20 August.*

²⁰⁶ The ENA has acknowledged that it “is true that the use of current replacement costs will result in an increase in the value of the initial RAB (as indeed the material developed by PwC and SKM suggests will be the case) relative to disclosed values.” Refer: ENA, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base, 20 August 2010*, p. 23, paragraph 106. Indeed, the size of the uplift implied by the approach proposed by PwC and SKM is potentially very large indeed, as discussed further in paragraph E2.44 and footnote 578.

²⁰⁷ There is however, arguably, an inconsistency between some submitters’ preferred approach for establishing the initial RAB value using ODV and the same submitters’ preferred approach for rolling forward the RAB value.

²⁰⁸ Refer footnote 108.

²⁰⁹ A number of the conclusions in this section are supported by the findings of a report on asset valuation that the Commission requested an advisory panel to provide in an independent capacity. This panel comprised academics in the field of regulatory economics: Professor George Yarrow, Dr Martin Cave, Dr Michael Pollitt and Dr John Small. Refer:

- 4.2.11 One of the key factors that influence asset values in workably competitive markets is the extent of asset specialisation. At one end of the spectrum, there are workably competitive markets in which the vast majority of assets could be used for a variety of different purposes and which can therefore be considered ‘non-specialised’ (e.g. land). The other end of the spectrum comprises workably competitive markets in which asset specialisation is important. To the extent that assets are specialised, they have little value in alternative use – once capital is committed such service or market-specific assets are sunk. Where sunk costs are significant, physical capital is not mobile between different uses.
- 4.2.12 In the markets regulated under Part 4, assets can be considered to be highly specialised.²¹⁰ These assets have little value in an alternative use and no assets in alternative uses could fulfil a similar specialised function. This characteristic causes barriers to entry into, and exit from, regulated markets to such an extent that competition is not workable.²¹¹
- 4.2.13 Asset specialisation lay at the centre of much the debate about the valuation of assets under Part 4. Compared to the Commission and the Experts, submissions received from or on behalf of regulated suppliers generally consider that relatively strong predictions can be made about the valuation of specialised assets in workably competitive markets. A number of submitters also attach more weight than the Commission to the insights that are derived from the valuation of assets in workably competitive markets in which there is a lesser degree of asset specialisation. The reasons for these differences in opinion are explained in paragraphs 4.3.52 - 4.3.63 below.
- 4.2.14 Before turning to these issues, this section highlights the way asset specialisation affects the valuation of assets in workably competitive markets. It does this by outlining the insights from asset valuation in workably competitive markets that can be reached by considering:
- factors affecting profitability—and thus asset values—in all workably competitive markets (paragraph 4.2.15);
 - the valuation of non-specialised assets in workably competitive markets (paragraphs 4.2.16 - 4.2.17); and
 - the valuation of assets in workably competitive markets in which there is a greater degree of asset specialisation (paragraphs 4.2.18 - 4.2.26).

Asset valuation in all workably competitive markets

- 4.2.15 As discussed in Chapter 2, the factors likely to affect the expected profitability—and thus asset values—of a supplier operating in any workably competitive market includes such things as the number of existing and potential competitors, the costs

Yarrow, G., Cave, M., Pollitt, M., Small, J., *Asset Valuation in Workably Competitive Markets - A Report to the New Zealand Commerce Commission*, May 2010.

²¹⁰ Asset specialisation and sunk costs are discussed in paragraphs 2.6.4 - 2.6.14.

²¹¹ Barriers to entry and exit are created by specialised assets for a variety of reasons. For an example of some of the key reasons, refer: Commerce Commission, *Regulatory Provisions of the Commerce Act 1986 - Discussion Paper*, 19 December 2008, pp. 16-17, paragraphs 49-50.

facing these rivalrous entities (both those costs incurred now and those expected in the future), the extent of any contracting arrangements, and any changes in the likely path of future demand. The interplay between these various factors will vary between different markets and thus the same factor will not have the largest bearing on valuations in all markets. Each of these factors will affect expected profitability—and thus asset values—more heavily in some markets than in others.

Valuation of non-specialised assets – opportunity cost

- 4.2.16 Since a non-specialised asset can be readily redeployed between different uses, the value of such an asset in its existing use will reflect quite closely its highest value in an alternative use. The reason for this is that owners can boost potential returns by employing their assets elsewhere if this is more profitable. This process of redeployment will tend to harmonise the values of similar assets employed in different activities throughout the economy. As a result, the expected profitability of an asset with multiple potential uses—i.e. a non-specialised asset—will generally reflect its profitability in an alternative use, which in turn will reflect its value in an alternative use.²¹² Economists refer to this forward-looking alternative use value as the asset's 'opportunity cost'.²¹³
- 4.2.17 Put another way, the value of a non-specialised asset will be similar to the cost of replacing the asset with an equivalent asset that is redeployed from an alternative activity.²¹⁴ This is because a similar second hand asset could be redeployed from another market, at a price broadly equal to its value in that market. There is therefore a strong convergence between asset values in a particular market and replacement costs in this sense. However, asset values may deviate from the cost of building a *new* asset at today's prices. This is because of construction and ordering lags²¹⁵ and changes in the buoyancy of the economy.²¹⁶

Valuation of assets when specialisation is more significant – a wider potential range

- 4.2.18 By definition the value of a specialised asset in a workably competitive market is unlikely to bear a particularly close relationship to its value in an alternative use. The reason for this is that owners are not able to redeploy specialised assets readily if there is a change in expected profitability. As a result, the value of a specialised asset in its existing use will be unlikely to correspond closely—if at all—to its opportunity cost.
- 4.2.19 Likewise, the cost of replacing an asset by redeploying another asset from an alternative use is of very limited relevance to the value of a specialised asset. Assets

²¹² *ibid.*, p. 15. Put another way, the net cash flow derivable in each use would be similar.

²¹³ The term opportunity cost is used because it refers to the most valuable alternative being forgone, and thus the cost of a lost opportunity (e.g. for investment).

²¹⁴ *supra* n 209, p. 15.

²¹⁵ *ibid.*, p. 15.

²¹⁶ *ibid.*, p. 16. The reason that construction and ordering lags will have an effect is that existing assets are capable of producing a return from today forward, whereas newly constructed assets may not be commissioned until some years into the future. Hence, due to the fact that a dollar today is worth more than a dollar tomorrow, the value of an existing asset may not correspond particularly closely to the value of an asset yet to be commissioned. Of course, for many non-specialised assets, there will be little delay between ordering and delivery of such assets. The buoyancy of the economy is relevant to the extent that it implies that there is either excess capacity or a capacity constraint across the whole economy. This will lead to a general depression or revival in asset values across the economy relative to the costs of new replacements.

employed in alternative uses are unlikely to be able to fulfil the specialised function of existing assets. So replacement cost, in the sense of replacement with a used asset, is not particularly relevant to the valuation of specialised assets in workably competitive markets.

4.2.20 The cost of replacing a specialised asset part-way through its useful life must therefore be assessed with reference to the cost of constructing a new asset. As noted above, however, the relationship between the costs of installing an entirely new asset and the value of an existing asset—specialised or otherwise—may be fairly distant. One is not a reliable proxy for the other due to, amongst other things, ordering and construction lags.

4.2.21 As the extent of asset specialisation in a market becomes more pronounced, the link between prices—and thus asset values—and the cost of replacing assets at today's prices is more limited. The inter-linked reasons for this include:

- the fact that workable competition, if it exists, will in most cases tend to exert pressure on prices through rivalry between a number of established suppliers rather than the competition implied by potential new entrants. This limits the importance of changes in the cost of investing in new assets at any given point in time, since each existing supplier is unlikely to need to replace all their assets at once. Any effect will only occur with a lag. This means that replacement costs at different points in time will be relevant to asset values, not simply the cost of replacing assets today;²¹⁷ and
- the fact that uncertainty about the future or barriers to entry or exit mean that expected profitability may have to change by quite a distance—in either direction—before new entry occurs, or before existing suppliers exit the market.²¹⁸ This implies that asset values can rise above or fall below the costs of replacing assets, and remain there durably.²¹⁹ Moreover, it cannot simply be the current cost of replacing assets that matters to the timing of investment; the replacement costs expected in future time periods would play a role too.²²⁰

4.2.22 In addition, long-term pricing arrangements between consumers and suppliers are more likely in workably competitive markets where specialised investments are common. This is because they help guard against the risk of opportunism by either suppliers or consumers once the investment has been made. These arrangements may be of either an implicit, reputational variety (such as when there is a repeated relationship between two or more parties), or enshrined explicitly in a mechanism such as a long-term contract.²²¹ Credible relationships of this nature—where both

²¹⁷ *ibid.*, p. 19.

²¹⁸ *ibid.*, p. 22.

²¹⁹ *ibid.*, p. 22.

²²⁰ *ibid.*, p. 22.

²²¹ *ibid.*, p. 19. Many of the submissions on reasoning contained within the Draft Reasons Paper in relation to these arrangements appear to have considered that the Commission was only focused on a narrow interpretation (i.e. solely on explicit long-term contracts). The Commission made clear, however, that the relationships to which it was referring are a good deal broader than long-term contracts. As noted above, these relationships need not be explicit. Regulation is often analysed as a type of (highly) incomplete contract between investors and consumers, i.e. regulatory asset values provide an implicit basis for assessing the economic relationship between the supplier and its consumers over the long-term. As noted at page 27 of the Experts' Report of May 2010, in a workably competitive market, the existence of

parties are confident that the other will not act opportunistically—limit the responsiveness of profitability to changes in market conditions (e.g. if replacement costs increased).

- 4.2.23 When there are on-going relationships between suppliers and consumers as a result of asset specialisation, prices would be likely to be informed—at least to some extent—by the costs actually incurred by a supplier. The most direct and obvious link with past history arises when outcomes are determined—at least in part—by explicit long-term contracting arrangements.²²² These arrangements need not link prices to a replacement cost index, but can nevertheless result in outcomes that are consistent with outcomes produced in workably competitive markets.²²³
- 4.2.24 There are a number of benefits associated with implicit or explicit long-term pricing arrangements. In particular, suppliers are limited in their ability to extract excessive profits relative to the costs that they actually incur. Suppliers nevertheless have appropriate incentives to invest, because pricing arrangements of this nature mean that they can expect to earn at least a normal rate of return over time. Profits would be sufficient to reward investment, innovation and efficiency. Without arrangements of this sort, a supplier may not have appropriate incentives to invest in specialised assets.
- 4.2.25 All the conditions described above are consistent with workable competition and, as a consequence, the value of a specialised asset will differ depending on the market context in which it is used. The valuation could conceivably be some way below or above the cost of replacing the entire collection of assets today.²²⁴ No point on this range can definitively be regarded as synonymous with the value of specialised assets in all workably competitive markets.
- 4.2.26 In summary, it is the Commission's view that:
- all of the valuation approaches discussed during consultation—i.e. those listed in Table 4.2 and existing regulatory valuations—produce valuations that are conceivably consistent with promoting outcomes consistent with outcomes produced in workably competitive markets;
 - in workably competitive markets sharing the most similarities with the markets regulated under Part 4—i.e. where there is a high degree of asset specialisation and an on-going relationship between suppliers and consumers—current replacement costs are just one of a number of factors that influence asset values;

long-term contracting may mean that asset values at the start of any period would tend to reflect the past bargains between consumers and suppliers, not simply the costs of replacing assets today. Based on this analysis, adjustments to prior existing valuations to reflect current replacement costs are not required. Refer *ibid*, p. 27.

²²² *ibid*, p. 37.

²²³ *ibid*, p. 21.

²²⁴ In a workably competitive market, asset values and cash flows over an asset's lifetime will reflect the fact that suppliers expect to earn a normal economic return on the investments they make. But at any point in time part-way through the lifetime of their assets, expectations—and thus asset values—will vary.

- in workably competitive markets suppliers expect to earn at least a normal rate of return over time; and
- an obvious corollary of the above is that the reference in the Part 4 Purpose to workably competitive markets alone does not require that regulatory valuations reflect current replacement costs when valuing specialised assets initially under Part 4, nor are they required at any point in the future (i.e. when rolling forward initial RAB values).

4.3 Valuation of Assets under Part 4

4.3.1 Context is important to deriving meaningful insights from the reference to ‘workably competitive markets’. There is an on-going relationship between suppliers and their consumers in the markets regulated under Part 4. In recent years, this relationship has been shaped by the regulatory arrangements applying to each supplier. During this period, the profitability of each regulated supplier could be assessed relative to regulatory asset value disclosed at the time.

4.3.2 As explained further below, there are good reasons for having regard to existing valuations:

- they sit amongst the valuations that are consistent with outcomes produced in workably competitive markets (paragraphs 4.2.10 - 4.2.26)
- in the context of a continuing relationship between suppliers and consumers, material changes to valuations—either upward or downward—would be unlikely to be consistent with the outcomes produced in workably competitive markets in which there is a high degree of asset specialisation (paragraphs 4.3.3 - 4.3.4);
- as discussed in paragraphs 4.3.5 - 4.3.6 below, one-off write-downs of existing regulatory values of specialised assets would be likely to be inconsistent with suppliers having appropriate incentives to invest (i.e. s 52A(1)(a));
- no factual evidence has been submitted to suggest that existing valuations will prevent suppliers earning at least a normal return on the original costs of installing assets (paragraph 4.3.7);
- as discussed in paragraphs 4.3.8 - 4.3.9 below, one-off write ups of existing regulatory values of specialised assets would be inconsistent with suppliers being limited in their ability to extract excessive profits (i.e. s 52A(1)(d)); and
- it is consistent with good regulatory practice to have regard to valuations that have been permitted in the past (paragraphs 4.3.10 - 4.3.12).

The long-term benefits of credible on-going relationships in workably competitive markets

4.3.3 In workably competitive markets in which there is a high degree of asset specialisation, credible on-going relationships deliver benefits for both suppliers and consumers in the long-term (paragraphs 4.2.22 - 4.2.24 above). This is because credible pricing arrangements provide a more certain environment for investment.

Short-term opportunism by either suppliers or consumers in these markets can undermine these on-going relationships and cause detrimental outcomes in the long-term.²²⁵

- 4.3.4 Likewise, regulatory decisions around the valuation of specialised assets—and thus an appropriate level of pricing—can have a significant effect on regulated outcomes. Monitoring or setting prices on a materially different basis to that used in the past would be likely to damage the confidence that suppliers and/or consumers have in the arrangements put in place under Part 4. As discussed further below, suppliers must be confident that they will have the opportunity to earn a normal return on new investments, and consumers would not be willing to pay excessive prices. This would not be consistent with the outcomes produced in workably competitive markets characterised by long-term relationships.

Preserving incentives to invest by having regard to prior regulatory valuations

- 4.3.5 Regulatory values must be set continuously at a level that provides comfort to suppliers that they will be able to earn sufficient revenues to recover any investments that they will make in new, upgraded and replacement assets (including the costs of financing those investments). The confidence that each supplier will have in this mechanism will be informed, at least in part, by the regulatory treatment of their past investments.
- 4.3.6 Write-downs of prior regulatory values of specialised assets should be avoided insofar as this may set a precedent that damages a supplier's incentives to invest in future. This is a key reason why regulators do not value specialised assets on the basis of opportunity costs. Such an approach would establish extremely low initial RAB values, which would not give rise to an environment that is conducive to future investment.
- 4.3.7 By contrast, submitters have not provided any factual evidence to suggest that existing regulatory valuations will fail to provide them with the opportunity to earn at least a normal return on the original cost of installing the assets used to supply regulated services.²²⁶ Reference to existing regulatory valuations when establishing initial RAB values under Part 4 should therefore give regulated suppliers no concern about the recovery of future investments. This approach is therefore consistent with s 52A(1)(a).

Limiting the ability to extract excessive profits by having regard to prior regulatory values

- 4.3.8 A material one-off increase in the regulatory value of a supplier's past investments on the basis of a replacement cost-based approach meets with similar objections to a material decrease on the basis of an opportunity cost valuation. An increase in pricing of the scale likely to be implied by a new replacement cost-based revaluation would be equally inconsistent with the outcomes produced in workably competitive markets characterised by on-going relationships between suppliers and consumers.

²²⁵ *ibid*, p. 19.

²²⁶ The Commission acknowledges that some submitters have argued that existing regulatory valuations could, in theory, be inconsistent with suppliers having the opportunity to earn at least a normal rate of return. This would only be possible if suppliers had been pricing in a certain way in the past. No submitter has provided any evidence to suggest that suppliers have been pricing in this way in practice.

- 4.3.9 In a workably competitive market, a supplier's ability to implement a substantial price increase that is inconsistent with pre-existing arrangements would be limited, not least because consumers would switch to a less opportunistic supplier (irrespective of whether the increase in prices was smoothed or sudden).²²⁷ In such markets, this switching limits suppliers in their ability to extract excessive profits. But in a regulatory context, consumers do not have the option to switch to an alternative supplier of the same service when prices are increased. Thus, regulated suppliers would not be limited in their ability to extract excessive profits in the event of a material one-off increase in regulatory valuations. This would be unlikely to be consistent with s 52A(1)(d).

Having regard to existing valuations is consistent with good regulatory practice

- 4.3.10 It is therefore appropriate to have regard to regulatory valuations of specialised assets that have been permitted in the past, even when the scope and objectives of regulation have changed.²²⁸ That the Commission should have regard to prior regulatory valuations when valuing assets under Part 4 is underscored by comments made by Dr Michael Pollitt in response to submissions on the *Joint Report on Asset Valuation in Workably Competitive Markets*.²²⁹

The introduction of the 2008 Commerce Act could be expected to bring both change and continuity. Change in the sense that there would be line under old disputes about the basis for regulating the industry. Continuity in the sense that the 2008 Act is set within a general context of a country committed to the protection of private property rights, where some reasonable reference to past valuations of regulated assets is to be expected.

- 4.3.11 Submitters have expressed a number of concerns in relation to these existing regulatory valuations (e.g. correction for known errors). As discussed further below, the Commission has remained open to these concerns and has accepted many of the adjustments that submitters have proposed to existing regulatory valuations. These adjustments will generally have relatively minor effects in value terms but will reinforce the credibility of the initial RAB values that will be established for each supplier.
- 4.3.12 Having made these adjustments, the valuations represent a 'line in the sand' at the start of Part 4. Combined with a move away from replacement cost-based approaches more generally under Part 4 (paragraph 4.3.66- 4.3.84), this will help reduce the scope for debate about asset valuation in future.
- 4.3.13 The 'locked in' initial RAB values are then to be rolled forward in a relatively straightforward way. Capital additions will be included at cost, RAB values will be linked to the CPI and straight-line depreciation is to be applied as the standard depreciation approach. Suppliers may apply alternative depreciation approaches under a CPP where the Commission is satisfied that, given the supplier's particular circumstances, the alternative better meets the Part 4 Purpose than the standard

²²⁷ *ibid*, p. 19.

²²⁸ As discussed further below (paragraphs 4.3.30- 4.3.36), a number of submitters consider that it is consistent with good regulatory practice to have regard to prior regulatory arrangements when establishing initial RAB values under Part 4. They have stressed however that doing so requires that the Commission act in a way that is consistent with any commitments made under the previous regulatory arrangements, which—in their view—requires that new ODVs be undertaken to establish initial RAB values under Part 4.

²²⁹ Yarrow, G., et al., *Submissions Review*, supra n 38, p. 23.

depreciation approach. Amongst other things, this approach is consistent with prudently financed suppliers being able to finance efficient investments. Greater detail about the way the RAB is to be rolled forward can be found from paragraph 4.3.66 onwards.

Views of submitters on the valuation of assets

4.3.14 The majority of submissions received from or on behalf of regulated suppliers consider that the valuation methodology outlined above is inappropriate. For various reasons, these submitters consider that a new replacement cost-based (ODV) valuation is required. Such a valuation would be likely to lead to a material increase in regulatory valuation for each supplier.²³⁰ This section outlines the key themes to these arguments.

4.3.15 Some submitters have argued that if the Commission were to have regard to previous regulatory arrangements when establishing initial RAB values under Part 4, then this would require new replacement cost-based valuations to be undertaken for these businesses.²³¹ In particular, some EDBs have argued that they expected that they would be required to undertake new replacement cost-based valuations under the previous Part 4A regulatory arrangements.

4.3.16 By contrast, most other regulated suppliers consider that it would be inappropriate to have any regard to prior regulatory arrangements when valuing assets under Part 4. This is because, in their view:

- Part 4 should represent an entirely fresh start to regulation,²³² and/or
- existing regulatory valuations are the subject of deficiencies that mean they would be unsuitable under Part 4. It has been argued, for example, that existing regulatory valuations are not sufficiently “robust” for price control.²³³

4.3.17 These submitters have argued that the most relevant insights for asset valuation are those derived from markets that share few, if any, characteristics to those in which gas pipeline and electricity lines businesses operate. These are said to be amongst the “better functioning” workably competitive markets because there are minimal (if any) barriers to entry and exit, and thus the threat of entry from other firms provides

²³⁰ Refer, for example, footnote 206.

²³¹ Refer, for example: Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 39, paragraph 93.

²³² Refer, for example: Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, pp. 10-11, paragraph 59; Orion New Zealand Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 20 August 2010, paragraph 7.22.1, p. 9; Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper, Attachment: CEG Report on Input Methodology for Asset Valuation*, August 2010, paragraph 122, p. 37.

²³³ For example, in addition to arguing that new valuations would be consistent with expectations under prior regulatory arrangements, Vector has argued that existing valuations are not sufficiently robust. Refer: Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, paragraph 181(c), p. 65. Vector has also argued that the regulatory valuations that are consistent with the terms of the Gas Authorisation are not consistent with the Part 4 Purpose. Refer: Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, paragraphs 166-167, p. 61.

a strong constraint on the market power of incumbents.²³⁴ These are therefore markets in which there is only a limited degree of asset specialisation.

4.3.18 The common theme in the arguments that have been advanced is that the insights from these workably competitive markets invariably and in the view of submitters “inexorably” point towards a new replacement cost-based valuation for each supplier at the start of Part 4.²³⁵ Without repeating the arguments in full here, the main themes can be summarised as follows:²³⁶

- The use of replacement costs is justified by the theoretical Hypothetical New Entrant test. Under the conditions of this theoretical model—which assumes that sunk costs are zero—the threat of entry from potential competitors acts as the primary constraint on the profitability of existing suppliers. Markets in which the threat of entry effectively constrains market power in this manner are said to be ‘contestable’. Thus it is proposed that the relevant touchstone for the valuation of assets under Part 4 is the costs facing a ‘Hypothetical New Entrant’ into each market.
- While asset values can and do depart temporarily from replacement costs in workably competitive markets, they will not be persistently above or below replacement costs in the long-run, nor is there any reason to expect that asset values will be systematically above or below replacement costs over time.²³⁷ Asset values will already correspond to their replacement cost or, if the market is in a temporary disequilibrium, a re-alignment process will be underway.²³⁸ The market equilibrium, at which supply and demand are in balance, is said to be the appropriate basis for valuation under Part 4.
- Greater weight should be given to the importance of long-run equilibrium conditions, rather than short run dynamics of a market. Current replacement cost is the outcome that would be observed in a market in long-run

²³⁴ Refer, for example: Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Response to the discussion of Asset Valuation in the Draft Decisions Document: a letter for Powerco Limited*, 19 August 2010, p. 11.

²³⁵ Powerco Limited, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009, p. 8, paragraph 11.

²³⁶ Refer, for example: Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, pp. 16-25; Orion New Zealand Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, pp. 4-8, paragraphs 7.7-7.18; Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 20 August 2010, p. 21-30, paragraphs 75-120; Unison Networks Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Charles River Associates, *Asset Valuation for New Zealand Electricity Distribution Services: a report prepared by Dr. William Bishop for Unison Networks Limited*, 19 August 2010.

²³⁷ For example, Unison Networks Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Charles River Associates, *Asset Valuation for New Zealand Electricity Distribution Services: a report prepared by Dr. William Bishop for Unison Networks Limited*, 19 August 2010, p. 7, paragraphs 30–31.

²³⁸ Orion New Zealand Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: NERA, *Asset Valuation: a report prepared for Orion New Zealand Limited*, 19 August 2010, p. 9.

equilibrium.²³⁹ These tendencies towards equilibrium, it is argued, are constant in workably competitive markets, including in workably competitive markets where there is a higher degree of asset specialisation.

- Empirical evidence suggests that even if asset values do deviate from replacement costs in the short-term then they will still trend towards replacement costs over the longer-term.

4.3.19 The majority of these submitters generally do not, however, consider that the Part 4 Purpose has the same implications for asset valuation in future as it does for the initial valuation of assets. In other words, in the view of most submitters, a replacement cost-based approach must be used to establish the initial RAB value but need not be used to roll forward the RAB over time. The two main reasons that submitters have provided for this view are that:

- the valuation of the RAB initially is a more material issue for investors than the way it is rolled forward over time.²⁴⁰ This is because the initial RAB value results in a one-off NPV change whereas most roll forward approaches are NPV-equivalent.
- a replacement cost-based approach is only required initially because existing regulatory valuations are flawed.²⁴¹

4.3.20 In summary, there are three key issues in relation to the initial valuation of assets under Part 4:

- First, are new replacement cost-based valuations or other adjustments required on the basis that—in the view of submitters—this would be consistent with the regulatory arrangements previously applying to particular suppliers (paragraphs 4.3.21 - 4.3.36)?
- Secondly, and on a related point, are existing regulatory valuations suitable for the purposes of regulation under Part 4 (paragraphs 4.3.37 - 4.3.46)?
- Thirdly, would a new replacement cost-based valuation better meet the Part 4 Purpose than having regard to existing regulatory valuations, given the need to promote outcomes consistent with outcomes produced in workably competitive markets (paragraphs 4.3.47 - 4.3.63)?

²³⁹ J. Balchin (for Powerco), *Response to the Discussion of Asset Valuation in the Draft Decisions Document*, 19 August 2010, pp. 2 and 10.

²⁴⁰ Refer, for example: Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 20 August 2010, p. 31, paragraph 125.

²⁴¹ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, p. 11.

Consideration of issues raised in relation to the existing regulatory valuations

4.3.21 This section addresses the first two of these three questions. It outlines:

- the valuation approaches that have been used to derive valuations consistent with the regulatory arrangements previously applying to each supplier;
- the views of submitters on the valuations that would be consistent with past regulatory arrangements and the Commission's response to these views; and
- the perceived 'deficiencies' that submitters consider there to be with existing regulatory valuations and the Commission response to these concerns.

Existing regulatory valuations

4.3.22 Regulated suppliers were previously subject to different types of regulation before the enactment of the new Part 4. For EDBs, as set out in Chapter 2 the relationship with their consumers has been shaped since 2001 by the information disclosure regime and targeted control ('thresholds') regime under the now-repealed Part 4A of the Act. All GPBs have been subject to the Gas (Information Disclosure) Regulations 1997, and the gas distribution services supplied by Powerco and Vector (Auckland) have also been subject to the Gas Authorisation since 2005. These two GDBs remain subject to the Gas Authorisation until 1 July 2012.

4.3.23 For each supplier, the valuation approaches used to derive existing regulatory valuations have been similar but not identical, primarily as a result of the differences in the applicable regulatory provisions. All suppliers have previously estimated the value of their asset base at some point in the past by referring to the cost of replacing their network with modern equivalent assets (i.e. they have all previously used a 'replacement cost-based' approach). The year in which each supplier undertook their last replacement cost-based valuation varies, however, as does the exact type of replacement cost-based valuation approach that was applied. They have also used a variety of different approaches to update those valuations to 2009.

4.3.24 The first full calendar year in which all regulated suppliers disclosed information about the value of their assets under the transitional provisions applying under Part 4 was 2009:

- In the case of EDBs, the 2009 valuations were prepared in accordance with fairly prescriptive regulatory requirements applying under Part 4A. In particular, all EDBs were required to use ODV to value their assets in 2004. To ensure these valuations were undertaken on a consistent basis, the Commission developed an ODV handbook through extensive consultation (so that, for example, the replacement costs used by each supplier for each type of modern equivalent asset were the same). Under the current information disclosure requirements for EDBs, these 2004 ODV valuations—and any subsequent capital additions—had to be updated year-on-year using straight-line depreciation and CPI-indexation, with the exception of easements (the values of which were neither indexed nor depreciated).
- GPBs have disclosed information about the value of their assets in accordance with less prescriptive regulatory provisions. The Gas Information Disclosure

Regulations did not mandate the application of any particular asset valuation approach, although the MED published a draft ODV handbook for the valuation of GPBs in June 2000.²⁴² The Commission determined that the value of Powerco's and Vector's (Auckland) assets at the start of the Gas Authorisation in 2005 should be established with regard to the most recent ODVs valuations that had been prepared by the companies consistent with the approach set out in that ODV handbook, updated since the date of those valuations to 2005 for straight-line depreciation, and capital expenditure. While some GPBs also used the draft handbook when preparing their latest replacement cost-based valuations under the Gas Information Disclosure Regulations, they were free to apply an alternative. Some GPBs elected to apply an ODRC or a DRC approach rather than ODV.²⁴³

- 4.3.25 Despite the differences in approach used by each regulated supplier to value their assets, all the valuations discussed above for EDBs and GPBs are consistent with the regulatory provisions that applied to each supplier at the time.
- 4.3.26 A key feature of the information disclosure regulations that were in place since the 1990s was that any revaluations gains were recognised 'as income' in disclosed profitability measures. This is because upward asset revaluation implies a higher level of expected profitability in future, and downward revaluations imply a lower level of profitability in future. This is true in both workably competitive markets—where asset values rise and fall on the basis of changes in expected profitability—and in regulated markets—where the asset value determines those expectations. These longer term profitability effects of asset revaluation had to be taken into account under the previous regulatory arrangements.

Views of submitters on the valuations that would be consistent with past regulatory arrangements

- 4.3.27 As noted above, a number of regulated suppliers have argued that new replacement cost-based valuations should be undertaken at the start of regulation under Part 4 because in their view the Commission stated at a point in the past that it would

²⁴² Consistent with the recommendation during the Government's 2001 Gas Sector Review to undertake a one-off review of the prevailing ODV valuations, during the Gas Control Inquiry the Commission published a report reviewing the most recent ODV valuations for GPBs that were available (typically as at 2002 or 2003). Refer: Energy Market Consulting Associates (EMCa), *Gas Control Inquiry: Consistency Review of ODV Network Asset Valuations*, February 2004. The Commission concluded that the GPBs' ODV valuations were more robust than their historic cost valuations and were reasonably comparable between businesses, with the exception of Powerco's 2002 ODV valuation. Powerco's original 2002 ODV valuation was nonetheless considered suitable for the purposes of the Gas Control Inquiry. Refer: Commerce Commission, *Gas Control Inquiry Final Report*, 29 November 2004, paragraphs 8.31 and 8.79. See also paragraphs F5.19 - F5.26 in Appendix F.

²⁴³ Thus, the most recent replacement cost-based valuations for the GPBs under existing regulatory provisions, and the way that they have been updated to 2009 in the 2009 disclosures or implicitly in the Gas Authorisation, are as follows: Wanganui Gas's 2008 DRC, updated in the 2009 disclosures for subsequent capital additions and disposals, and depreciation; MDL's 2006 ODRC, updated in the 2009 disclosures for subsequent capital additions and disposals, depreciation and CPI-indexation (and which underpins MDL's current pricing arrangements with the users of the Maui pipeline); Vector (NGC Distribution and NGC Transmission)'s 2003 ODVs which were used during the Gas Control Inquiry (adjusted in 2004 and 2005 respectively for upwards accounting 'fair value' adjustments), updated in 2009 disclosures for subsequent capital additions and disposals, and depreciation, without indexation; and Powerco's 2002 ODV and Vector (Auckland)'s 2003 ODV—revised for consistency with each other during consultation on the Gas Authorisation—updated to 2009 for subsequent capital additions and disposals, depreciation and CPI-indexation from 2005 onward (and which underpin the price paths in the Authorisation).

require EDBs to undertake a new ODV revaluation in 2008.²⁴⁴ Vector has also argued that it expected that, if and when the NGC assets were subject to price-quality regulation, that an up-to-date ODV valuation would be applied.²⁴⁵

- 4.3.28 In relation to the past statements made by the Commission, EDBs have stressed the importance of ‘regulatory commitment’ when establishing the initial RAB value. Some submitters referred to this commitment as a ‘regulatory compact’, where changing outcomes unilaterally should not be expected both from the Commission and from lines businesses.²⁴⁶ For instance, Vector argued that the Commission would be justified in departing from previous principled decisions only when the approach is not permitted under the new Part 4, or when the previous approach was illegal, unprincipled or based on factual error; and while new circumstances may justify a different approach going forward, they should not provide the basis for retrospectively changing decisions. Vector noted that one of the key issues in relation to regulatory commitment is “the impact inconsistent decision-making has on investor’s perceptions about how the regulator will behave in the future”.²⁴⁷
- 4.3.29 In relation to Vector’s expectations in particular, the reason that Vector argues that its existing valuation should not be used is that its pricing could depart from the level implied by its existing regulatory valuations.²⁴⁸ Since Vector’s NGC Distribution and NGC Transmission assets were not subject to the Authorisation, Vector has therefore submitted that applying a similar approach to that used in the Authorisation would amount to ‘retrospective’ regulation (i.e. because it is based on Vector’s past pricing). Vector considers that a new replacement cost-based valuation should be undertaken instead.

Consideration of whether existing regulatory values are consistent with past regulatory arrangements

- 4.3.30 It is important to have regard to the regulatory valuations that are consistent with previous regulatory arrangements when valuing assets under Part 4, but this does not mean that new replacement cost-based valuations must be undertaken at the start of Part 4.
- 4.3.31 For one thing, it is not clear why submitters consider that the effects of any revaluation should not be treated as income at the start of the Part 4 regime. Under the previous information disclosure regulations, asset revaluations had to be taken into account by treating revaluation gains ‘as income’ in profitability indicators (paragraph 4.3.26 above). Treated this way, any new valuation would be broadly equal in value terms to the valuation derived using existing regulatory values. Ignoring the effect that any new valuation would have on revenues expected in

²⁴⁴ Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 39, paragraph 93.

²⁴⁵ *ibid*, p. 64-67.

²⁴⁶ AECT, Input Methodologies Electricity and Gas Workshop Transcript, p. 134, lines 1-14. Also refer: Orion, *Pre-Workshop Submission on Emerging Views*, 3 February 2010, pp. 4-5. In this case, Orion’s reference to a ‘regulatory compact’ is in the context of what Orion considers to be the Commission’s past commitment to remedy ‘deficiencies’ in the 2004 ODV valuations for EDBs (paragraphs 4.3.37 - 4.3.46 below).

²⁴⁷ Vector Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 16, paragraph 38(b)(i).

²⁴⁸ Refer, for example: Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010 p. 66, paragraph 188.

future would be inconsistent with the regulatory principles that were implemented under the Part 4A information disclosure regime, the Gas Information Disclosure Regulations and the Gas Authorisation.

- 4.3.32 In addition, as discussed further in Appendix F, the Commission consulted on undertaking new ODV revaluations in 2008. The Commission made a subsequent decision under Part 4A not to undertake a new ODV in either 2008 or 2009.²⁴⁹ This was consistent with industry advocacy at the time, which favoured the deferral of a number of proposed decisions in light of the review of the Act. The prospect of undertaking ODV revaluations at some point in the future did, however, remain open and has now been consulted upon during consultation on IMs. Ultimately, despite the submissions made by or on behalf of regulated suppliers, the approach has been rejected for the reasons outlined in this chapter.
- 4.3.33 It is also not clear that the outcome of a new valuation would necessarily meet the expectations of suppliers and consumers better than the existing regulatory valuations. The expected outcome of any such valuation would be sensitive to changes in the assumptions underpinning the ODV approach. What is more, during the Gas Authorisation, different interpretations *of the same specification of the ODV approach* resulted in valuation differences of up to 30 percent.²⁵⁰ Ranges of ODRC valuation outcomes in Australia have at times been even higher.²⁵¹ The nature of this valuation “lottery” was recognised by a number of submitters.²⁵²
- 4.3.34 Overall, there would appear to be no justification for new valuations on the basis of any perceived regulatory commitment under previous regulatory arrangements. No submitter has provided evidence to suggest that it would suffer a loss as a result of decisions made on the basis of any perceived commitment by the Commission (e.g. loss of revenue based on a decision made in light of a statement by the Commission). If this had been the case, then the case for undertaking a new valuation would be strengthened. As it is, the case is weak.
- 4.3.35 With respect to Vector’s NGC Distribution and NGC Transmission assets, no indexation was applied since the date of the last replacement cost-based valuation. While Vector (Auckland) was subject to the Authorisation, CPI-indexation was applied but the revaluation gains were appropriately treated as income. That is not necessarily the case for the Vector NGC assets so it is not clear that it would be appropriate to go back and apply indexation to the latest replacement cost-based valuations when establishing initial RAB values under Part 4. On the other hand, all other GPBs have been implicitly permitted some level of indexation since 2003.

²⁴⁹ Commerce Commission, *Update Notice, Regulation of Electricity Lines Businesses, Information Disclosure Requirements, Update on Amendments to the Requirements*, 19 December 2008.

²⁵⁰ Commerce Commission, *Authorisation for the Control of Supply of Natural Gas Distribution Services by Powerco Ltd and Vector Ltd, Decisions Paper*, 30 October 2008, paragraphs 376 to 397.

²⁵¹ *ibid*, paragraph E.15.

²⁵² The term lottery was used to describe ODV valuations by Mr. Ewan Morton (Synergies on behalf of Vector) during consultation. Refer: Commerce Commission, *Input Methodologies Electricity Distribution and Gas Pipelines Workshop Transcript*, 25 February 2010, pp. 124-125. A similar sentiment about the sensitivity of replacement cost-based valuations to the underlying assumptions used to derive the valuations has also been expressed by a number of other submitters. For a discussion, refer to: GPBs Draft Reasons Paper, paragraphs 4.4.13 to 4.4.58.

4.3.36 Consequently, although not necessary for consistency with the Part 4 Purpose, it would appear reasonable for Vector to be able to index the value of its NGC Distribution and Transmission assets since 2005, consistent with the Authorisation's approach to valuing Vector (Auckland)'s assets since 30 June 2005. It will result in an uplift to the regulatory valuation of the relevant assets, and is therefore in Vector's favour. The upward adjustment is in no way based on Vector's past pricing and there would not appear to be any justification for further uplifts. In particular, provided that the longer term profitability effects of asset revaluation are appropriately accounted for, this approach will ensure that Vector earn at least a normal return on the cost of installing its assets. Vector has not submitted any evidence to suggest that this would not be the case.

'Deficiencies' associated with existing regulatory valuations

4.3.37 Submitters have also raised a number of concerns with existing regulatory valuations. In their view, while the valuations may have been suitable for information disclosure regulation, the issues with existing valuations render them flawed and unsuitable (i.e. not 'fit for purpose') for setting price-quality paths for suppliers (refer Appendix F5). The concerns can be broadly divided into issues related to:

- the way in which a valuation approach was applied in order to prepare the latest replacement cost-based valuations (e.g. the information that the valuation was based on, any mistakes made during the valuation, and the fact that the circumstances in which the valuation was undertaken have since changed);²⁵³ and
- the way in which the valuation approach was specified in order to derive the latest replacement cost-based valuations (e.g. the principles, assumptions or other matters related to the specification of the replacement cost-based approach, such as the replacement costs that should be used).

4.3.38 This section addresses the Commission's response to concerns falling into the first of these two categories. The arguments in relation to the second category have been rejected. As discussed in greater detail below (paragraph 4.3.47 - 4.3.65), a new replacement cost-based valuation—based on an updated specification—is not required by the reference to workably competitive markets in the Part 4 Purpose. Nor would it be better at meeting the Part 4 Purpose than having regard to existing valuations (paragraphs 4.3.1 - 4.3.12). These valuations were prepared in accordance with the regulatory provisions applying at the time.

Consideration of perceived 'deficiencies' associated with existing regulatory valuations

4.3.39 The Commission has accepted the majority of the small number of adjustments that have been proposed by submitters during consultation on the appropriateness of existing valuations. These adjustments correct what submitters perceive to be deficiencies in the way that valuation approaches were applied when the latest

²⁵³ For example see Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper, Attachment: Statement of Duncan Ian Head*, 23 August 2010 pp. 20 -22, paragraph 6.3.

replacement cost-based valuations were prepared. Making such adjustments with the benefit of hindsight:

- effectively draws a ‘line in the sand’ at the start of Part 4 under the issues raised in relation to replacement cost-based valuations undertaken in the past; and
- reinforces the credibility of the existing regulatory valuations under Part 4.

- 4.3.40 In the Commission’s view, none of these adjustments are required for consistency with the reference to workably competitive markets in the Part 4 Purpose. Existing regulatory valuations already sit within the range of valuations that would be consistent with promoting outcomes consistent with those that occur in workably competitive markets. The adjustments nevertheless address a number of the concerns that suppliers have raised, and will therefore reinforce the credibility of the valuations used to set prices and assess returns.
- 4.3.41 The Commission also stresses that—while the adjustments proposed by submitters will reinforce the credibility of those valuations—initial valuations under Part 4 need not have a particular relationship to some form of ODV or ODRC valuation undertaken in the past. Those valuations are favoured simply because they were the valuations established under the regulatory provisions immediately prior to Part 4, and were considered appropriate at the time.
- 4.3.42 The adjustments proposed by submitters will generally result in fairly minor changes to valuations in value terms. Having regard to these valuations is consistent with meeting the Part 4 Purpose (paragraphs 4.3.1 - 4.3.12), and material changes—either upward or downward—would generally not be appropriate. In addition, the adjustments that have been accepted are generally in the favour of suppliers.
- 4.3.43 Fewer adjustments have been accepted for GPBs than for EDBs. This is because— with the exception of assets subject to the Gas Authorisation—GPBs have not been subject to any mandatory valuation approach and have therefore had greater flexibility in the way in which they have undertaken valuations. GPBs have also had the freedom to determine when to update their valuations. The case for adjustments is weaker where suppliers have already had the opportunity to correct for any perceived deficiencies under the existing regulatory arrangements.
- 4.3.44 By the same token, the Commission has not proposed revisiting the value of the Vector NGC Distribution and Transmission assets to address issues of consistency of the approach used to value the assets owned by Vector (Auckland). This treatment is likely to be conservative in Vector’s favour, but is appropriate because the valuations are consistent with the regulatory provisions that applied at the time.²⁵⁴
- 4.3.45 Having made these adjustments, the Commission highlights that there is no intention to revisit the valuations in a similar way at some point in the future. A key reason for

²⁵⁴ EMCa’s consistency review concluded that all available ODV/ODRC valuations would require some adjustments to be consistent with MED’s 2000 draft ODV Handbook. In the case of NGC Distribution and NGC Transmission, the net effect would be a significant downward revaluation. Refer: Energy Market Consulting Associates (EMCa), *Gas Control Inquiry: Consistency Review of ODV Network Asset Valuations*, February 2004, p. 4.

this is that any attempt to revisit an asset value would potentially result in write-downs as well as write-ups of regulatory values. The potential for such downward changes contributes to uncertainty for suppliers. As a result, regulators tend to ‘lock in’ asset values once established initially and then roll them forward year-on-year for additions, disposals, depreciation and some form of indexation. As discussed in paragraph 4.2.10 - 4.2.26, this approach is consistent with promoting outcomes consistent with outcomes produced in workably competitive markets. It is also the roll forward approach the Commission favours under Part 4 (paragraphs 4.3.66 - 4.3.88).

- 4.3.46 The specific adjustments that the Commission has proposed for EDBs and GPBs are outlined and discussed in Appendix E. These adjustments reinforce the credibility of existing valuations.

Consideration of arguments related to the valuation of assets in workably competitive markets

- 4.3.47 The final key issue with respect to the initial valuation of assets is whether or not replacement cost-based valuations are required by the reference to workably competitive markets in the Part 4 Purpose (see paragraph 4.3.20).
- 4.3.48 The Commission has received a wealth of independent advice on this topic during the consultation process, both on behalf of regulated suppliers and from its Experts. Ultimately, the arguments that have been advanced in favour of new replacement cost-based valuations have not proved to be persuasive. As explained in greater detail below, the main reasons are that:
- it is wrong to dismiss existing regulatory valuations;
 - replacement costs are only one of a number of influences on the value of a specialised asset in a workably competitive market; and
 - long-run equilibrium is not a defining feature of the asset values that are produced in workably competitive markets (not in theory nor in practice).

Dismissing existing regulatory valuations would be wrong

- 4.3.49 The credibility of existing valuations has been reinforced by accepting the majority of the small number of adjustments submitters proposed to the valuations. Existing regulatory valuations are therefore suitable for use under Part 4. Only a limited number of adjustments to these valuations were proposed by submitters and, of these, very few were rejected.
- 4.3.50 If anything, the issues that have been raised in relation to prior replacement cost-based valuations provide more—not less—justification for relying on valuations that have been consulted upon and adjusted with the benefit of hindsight. This is because the concerns that submitters have expressed highlight that similar issues would be likely to affect new replacement cost-based valuations if they were undertaken in future. Given the strength of submissions, these issues could undermine the credibility of those valuations.

4.3.51 The arguments in favour of new replacement cost-based valuations are considerably weakened when considered in light of the existing relationship between suppliers and consumers that has been shaped by regulatory arrangements in the past. Material changes to these valuations—either upward or downwards—would be unlikely to be consistent with outcomes produced in workably competitive markets in which there are on-going relationships between suppliers and consumers. Such relationships are more likely to arise in workably competitive markets that have similar but not identical characteristics to those being regulated.

Replacement costs are only one of a number of influences on the value of specialised assets

4.3.52 There are some significant areas of common ground between the Commission and regulated suppliers. For example, it is widely accepted that replacement costs:

- are one of a number of factors that exert an influence on asset values in most if not all workably competitive markets (paragraph 4.2.15); and
- will have a relatively strong link to the value of assets in workably competitive markets in which barriers to entry and exit are low, and in which the extent of asset specialisation is fairly limited (i.e. markets that share few, if any, characteristics with the markets in which gas pipeline and electricity lines businesses operate).

4.3.53 A key point of difference arises because submitters consider that it would be inappropriate to consider the way that assets are valued in workably competitive markets that share some similarities to the markets regulated under Part 4 (i.e. in regard to the extent of specialisation of the assets involved). The reason for this is that they consider that workably competitive markets in which assets are specialised to a fairly large extent lie “possibly at the fringes of what may be considered workably competitive”.²⁵⁵ In the Commission’s view, this does not diminish the relevance of the valuations likely to be produced in these markets.

4.3.54 It would be wrong to completely ignore the wide variety of workably competitive markets that exist, especially those that most closely resemble the factual context of the markets for regulated services. This is because the Commission’s task lies in designing regulatory arrangements that are appropriate in light of the factual characteristics of regulated markets. Economic theory that assumes away these characteristics in their entirety is unhelpful and potentially misleading.

4.3.55 When the extent of asset specialisation increases, replacement costs are likely to have a distant relationship to asset values. This is because the costs facing potential entrants are just one of a number of possible factors that could constrain profitability and thus asset values of incumbents. They do not necessarily provide the strongest constraint because a high extent of specialisation of assets will weaken the threat of entry (i.e. it creates barriers to entry and exit).²⁵⁶ Workable competition between

²⁵⁵ Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: *PricewaterhouseCoopers, Response to the discussion of Asset Valuation in the Draft Decisions Document: a letter for Powerco Limited*, 19 August 2010, p. 11.

²⁵⁶ As is discussed further in Appendix F, for example, the CEO of Vector has stated that Vector could not have imposed the “significant price increases” on their controlled gas distribution business customers justified by a 2005 estimate of the cost of replacing their network with modern equivalent assets, because “a lot of these customers could simply have

incumbents within the market would, however, provide some constraint on pricing. Thus, in these circumstances, the cost of replacing the collection of assets at today's prices would only have a limited relevance to asset values. The costs incurred by incumbents in different time periods would begin to have a greater influence on prices.

- 4.3.56 Thus arguments that rely on the threat of entry to constrain the behaviour of incumbents therefore do not provide the “most conservative” estimate of the prices that would be observed in a workably competitive market; they simply rely on more onerous assumptions.²⁵⁷ These assumptions are not appropriate for valuation in the current context, because they preclude the possibility that competition within the market provides a greater constraint on prices (and by extension asset values) than competition from potential competitors.
- 4.3.57 The most relevant insights are likely to come from markets in which appropriate outcomes are produced despite—rather than in the absence of—a relatively pronounced degree of asset specialisation. Pricing arrangements in these markets are such that neither suppliers nor consumers will be able to profitably sustain an opportunistic attempt to exploit the other party once an investment has been made. In other words, the arrangements that prevent both suppliers and consumers from using their market power to ‘hold up’ the other party are relevant. This point was highlighted by the Commission’s Experts:²⁵⁸

Remembering that the purpose of the current exercise is to assist in the development of regulation, it is sensible to recognise both that the existence of workable competition is consistent with a range of different market circumstances and that it is those circumstances that are closer to the conditions prevailing in regulated or price-monitored activities that are likely to provide the more immediately relevant benchmarks. Since, in regulated industries, the regulator has an influence on selling prices that is akin to the potential influence of a buyer with market power – a similarity that is reflected in the economics literature on regulation, which focuses considerable attention on the ‘policy credibility’ or opportunism problem – we think it appropriate to direct attention to workably competitive markets that are subject to potential hold-up problems.

- 4.3.58 The Commission has therefore not been convinced by the case for drawing conclusions solely from the markets in which there is a low degree of asset specialisation.

Asset values in workably competitive markets are not defined by long-run equilibrium

- 4.3.59 In the view of submitters, asset values being in line with replacement costs represents the market equilibrium at which supply and demand are in balance, which in turn is said to be the appropriate basis for valuation under Part 4. While accepting that the value of a specialised asset can deviate from replacement costs in workably

substituted their gas energy use for electricity”. Vector, *Submission on Input Methodologies Draft Determinations, Asset Valuation, Statement of Simon Mackenzie*, 23 August 2010, paragraph 6.55. As is discussed above, and further in Chapter 2, competitive constraints come from a range of sources, including the threat of substitute goods or services. The price rises implied by a new replacement cost-based valuation would likely be even higher (footnote 578).

²⁵⁷ Refer, for example: Powerco Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 18, paragraph 59.

²⁵⁸ Yarrow, G., et al., *Asset Valuation Report*, supra n 209, p. 20.

competitive markets, they argue that replacement costs remain relevant because they continue to exert an influence over the longer term. They therefore consider that new replacement cost-based valuations are required because there are tendencies towards equilibrium in workably competitive markets.

- 4.3.60 While the Commission agrees that workably competitive markets will tend towards equilibrium over time, asset values in these markets are not defined by a long-run equilibrium. J.M. Clark is the academic widely credited with first distinguishing workable competition from other traditional economic models of competition (refer Chapter 2). He noted that in workably competitive markets, “tendencies towards equilibrium...never reach their static limits”.²⁵⁹ So in workably competitive markets, long-run equilibrium is unlikely to be reached, shortages and surpluses continuously arise and outcomes constantly evolve. Asset values in particular vary in light of changing expectations about the future, not simply in light of changes in replacement costs today.
- 4.3.61 Empirical evidence supports this conclusion. It demonstrates that while asset values in workably competitive markets characterised by specialised assets may occasionally converge with replacement costs, they only *very rarely if ever* equate and will normally diverge by a significant amount for a prolonged period of time, including in some cases indefinitely.²⁶⁰ The extent and duration of any deviation will be influenced by, amongst other things, any arrangements that shape the relationship between suppliers and their consumers.
- 4.3.62 This should not be taken to mean that equilibrium concepts are irrelevant to understanding the operation of workably competitive markets. It simply says that they are not a defining feature of these markets. Perfectly competitive equilibrium, for example, is a static concept and clearly does not describe the way in which any workably competitive market operates in reality. It nevertheless provides a way in which to think about the operation of markets that conform more closely to the underlying assumptions, and to explain differences in the operation of those that do not. These assessments are considered according to the facts pertaining to the conditions that actually exist in a particular workably competitive market. A number of other (often more relevant) theories of imperfect competition will also be referred to during these assessments. The aim is to align economic theory, as far as practicable, to the facts of the particular case.
- 4.3.63 Nor does it imply that replacement costs are entirely irrelevant to the determination of asset values under Part 4. When the efficient costs facing suppliers are expected to increase, it is appropriate that suppliers have the opportunity to recover those costs. Given the way that the RAB will be rolled forward (paragraphs 4.3.66 -

²⁵⁹ In economics, equilibrium usually refers to the point at which supply and demand are in balance, and market conditions are not changing. At this point, the price level is such that the amount that consumers seek to buy is exactly equal to the amount that suppliers are able to produce. Static long-run equilibrium could be achieved, in theory, if all changes in background economic parameters were to cease (e.g. demand stopped growing, technology remained the same), and suppliers were able to respond instantaneously and with full flexibility until no demand was left unsatisfied at the market price. Entry and exit during this adjustment process is assumed to be free and costless. Clearly, these static adjustments are not a descriptor of what happens in the real world. Suppliers operate day-to-day on the basis of the configuration of assets currently installed, prices cannot be varied instantaneously and the demand for services is ever changing.

²⁶⁰ Yarrow, G., et al., Asset Valuation Report, supra n 209, Annex 1.

4.3.88), replacement costs will continue to exert an influence on asset values over the longer-term. This is because replacement costs will affect asset values at the time that assets need to be replaced (i.e. suppliers will have the opportunity to earn a normal return on and of any efficient investments they make in future). They will also have a bearing when the RAB value is indexed to inflation, because inflation is affected by changes in replacement costs.²⁶¹

Conclusions on arguments in relation to the initial valuation of assets

4.3.64 In summary, the arguments that have been advanced in favour of new replacement cost-based valuations to establish initial RAB values under Part 4 are not persuasive:

- It is wrong to dismiss existing regulatory valuations:
 - existing valuations are consistent with promoting outcomes consistent with outcomes produced in workably competitive markets (paragraphs 4.2.10 - 4.2.26);
 - existing valuations reflect the continuing relationship between suppliers and consumers that has been shaped by past regulatory arrangements (paragraph 4.3.1);
 - given this context, material changes to existing valuations—either upwards or downwards—would be unlikely to be consistent with outcomes produced in workably competitive markets (paragraphs 4.3.3 - 4.3.12);
 - the credibility of the valuations has been reinforced by accepting the majority of the small number of concerns that submitters have expressed about the valuations (paragraph 4.3.12 - 4.3.46); and
 - if anything, the issues that have been raised in relation to prior replacement cost-based valuations provide more—not less—justification for relying on valuations that have been consulted upon and adjusted with the benefit of hindsight (paragraph 4.3.50).
- Replacement costs are only one of a number of influences on the value of specialised assets in workably competitive markets:
 - the predictions of an economic analysis that is based on assuming that assets display a limited degree of specialisation are misleading (paragraphs 4.3.52 - 4.3.58);
 - when there is a high extent of asset specialisation in a market, replacement costs are likely to have a more distant relationship to asset values than when there is a low extent of specialisation (paragraphs 4.2.18 - 4.2.25); and
 - valuations based on current replacement costs are likely to be higher, and provide a far less appropriate constraint on pricing, than valuations that are not predicated on assuming away—in their entirety—the high extent

²⁶¹ In theory, if conditions were to remain the same for a prolonged period of time—i.e. in a ‘steady-state’—then the RAB roll forward rules would result in asset values that tended towards, and eventually reached, a position that could be considered to be ‘in equilibrium’. In practice, it is unlikely that this equilibrium will ever be reached, owing to a variety of dynamic factors such as growth in demand. There will nevertheless be tendencies towards equilibrium, caused by the influence of replacement costs over the longer term.

of asset specialisation that is a central characteristic of the markets regulated under Part 4 (paragraph 4.3.56).

- Asset values in workably competitive markets are not defined by long-run equilibrium in theory or in practice (paragraphs 4.3.59 - 4.3.63).
- The initial RAB value does not need to reflect today's replacement costs for replacement costs to have an influence over the longer term (paragraph 4.3.63).

4.3.65 In reaching its decision to have regard to prior regulatory valuations, the Commission notes the following:

- Submitters were unable to demonstrate to the Commission's satisfaction that asset values in workably competitive markets characterised by substantial specialised assets would:
 - be equivalent to a new replacement cost-based valuation; or
 - bear a particularly close relationship to a new replacement cost-based valuation.
- Upward revaluations might be warranted if EDBs and GPBs were able to demonstrate that prices set on the basis of existing regulatory valuations would prevent them from earning at least a normal return relative to the original costs of their investments before profits appeared excessive. They have not done so. Existing valuations are therefore consistent with EDBs and GPBs having appropriate incentives to invest (i.e. s 52A(1)(a)), while interested persons will still be able to assess whether EDBs and GPBs are limited in their ability to extract excessive profits in future (i.e. consistent with s 52A(1)(d)).
- The new Part 4 Purpose does not in any way require new replacement cost-based asset valuations (such as new ODV valuations).
- It is difficult to reconcile as logically consistent the view that a one-off revaluation is unavoidable now with the view that further revaluations would be unnecessary.

Rolling forward the initial RAB value over time

4.3.66 Turning now to the way that the initial RAB value is updated year-on-year, decisions have been required around the form of depreciation that should be applied and the way in which revaluations are to be calculated.

4.3.67 This section:

- outlines the reasons for the approaches that are to apply under Part 4 (paragraphs 4.3.68 - 4.3.70);
- explains why the alternative ways of revaluing the RAB were rejected (paragraphs 4.3.71 - 4.3.84); and

- explains why the alternative ways of calculating depreciation were rejected (paragraphs 4.3.85 - 4.3.88).

Approaches that are to apply under Part 4

- 4.3.68 Under Part 4, RAB values will be linked to the CPI and straight-line depreciation is to be applied as the standard approach. As discussed in Chapter 2, these revaluations must be treated as income for price setting and price monitoring purposes. Suppliers may apply alternative depreciation approaches under a CPP where the Commission is satisfied that, given the supplier's particular circumstances, the alternative better meets the Part 4 Purpose than the standard depreciation approach. Likewise, while standard asset lifetimes have been set out in Schedule A of the Determination, alternative asset lifetimes may be accommodated through the CPP process. This approach would be consistent with the approaches that are used by the majority of regulators of similar services in Australia and the UK.
- 4.3.69 The advantages of CPI-indexed straight-line depreciation are relatively straightforward. In addition to protecting the regulatory value of each regulated supplier's investment in real terms, depreciation is calculated in a simple, transparent and well-understood form. A benefit of this approach is that it results in a relatively flat aggregate pricing profile in real terms over time. It is also consistent with a cash flow profile that is generally consistent with a prudently financed supplier meeting both their debt obligations and the costs of new investment.
- 4.3.70 The approach is therefore consistent with the suppliers having the ability—and thus the incentive—to invest, which is consistent with s 52A(1)(a). Like the other roll forward approaches that are equivalent on an NPV basis and are discussed below, suppliers will expect to earn a normal return over time when CPI-indexed straight-line depreciation is applied. This is consistent with suppliers being limited in their ability to extract excessive profits, as required by s 52A(1)(d).

Alternative ways in which revaluations could be treated

- 4.3.71 While some submitters have endorsed the use of CPI indexation,²⁶² support for this form of indexation is not unanimous. The main alternatives are all broadly equivalent in expected NPV terms, but result in different cash flow profiles for suppliers. The main alternatives are:

- no indexation;²⁶³

²⁶² Amongst others, CPI-indexation was favoured by: Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 75, paragraph 217. Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 20 August 2010, p. 31, paragraph 121; Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, p. 14, paragraph 43; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 22, paragraph 63.

²⁶³ For example, AECT consider that an un-indexed approach would be appropriate if revaluations gains are to be treated as income (i.e. if suppliers are broadly constrained to expecting to earn a normal return). Refer: Auckland Energy Consumers Trust, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: NZIER, *Asset Valuation Report*, 19 August 2010, p. 4.

- on-going replacement cost based valuations or some form of replacement cost or producer price index.²⁶⁴

No indexation of RAB values

- 4.3.72 If no indexation was applied to RAB values, then cash flows generated by each asset would be brought forward because depreciation in the earlier years would be higher. Such an approach would be consistent with suppliers having sufficient cash flows to finance their debt obligations, and would generally result in a more rapid recovery of the value of each supplier's investments.
- 4.3.73 An un-indexed approach will result in higher revenues for some suppliers, but not for all suppliers. This is because a supplier's overall cash flows are determined by the average age of the asset base not by the age of any particular asset. Those suppliers with a relatively immature asset base will receive higher cash flows now than they would under a CPI-indexed approach. On the other hand, those that have an older capital stock could receive lower revenues.
- 4.3.74 Those suppliers that would receive higher cash flows under an un-indexed approach would potentially face reduced risks because less capital would remain to be recovered in future (i.e. the RAB value would reduce more quickly).
- 4.3.75 To the extent that suppliers will be unable to recover the full RAB value in future—e.g. if demand was going to fall away entirely—then this would argue in favour of a faster recovery profile than that implied by CPI-indexation. At present, however, assets used to supply regulated services are trading at a premium above the RAB value.²⁶⁵ Investors in these assets therefore appear to expect to recover at least the RAB value of the assets used to supply regulated services.
- 4.3.76 There is also no reason why the Commission's approach—in which CPI-indexed straight-line depreciation is to apply as the standard approach—should cause a prudently financed supplier to have difficulties financing their investments, particularly given the treatment of taxation (Chapter 5).
- 4.3.77 The benefits of increased cash flows in the early years of an asset's lifetime will not, in general, outweigh the benefits associated with CPI-indexation (paragraphs 4.3.69 - 4.3.70).²⁶⁶

²⁶⁴ As favoured by, amongst others: Orion New Zealand Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 20 August 2010, p. 26, paragraph 7.76; Dr. William Bishop on behalf of Unison Networks, see Unison Networks Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: Charles River Associates, Asset Valuation for New Zealand Electricity Distribution Services: a report prepared for Unison Networks Limited by Dr. William Bishop*, 19 August 2010, p. 17, paragraph 52.

²⁶⁵ Refer, for example: Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: Cameron Partners, Relating to a market based rate of return assessment: a report to Transpower New Zealand Limited*, 16 August 2010, p. 25.

²⁶⁶ As discussed in the IM (Transpower) Reasons Paper, in some circumstances an un-indexed approach may be appropriate, as is the case currently for Transpower.

On-going replacement cost-based valuations/Replacement cost or producer price indices

- 4.3.78 The arguments in favour of explicit use of replacement costs to update the value of the RAB tend to mirror those that have been advanced in favour of establishing the initial RAB value with reference to current replacement costs. The Commission does not consider that such an approach is required by the reference to workably competitive markets in the Part 4 Purpose.
- 4.3.79 In addition, the likely cash flow effects of repeated replacement cost or producer price index, relative to a CPI-indexed approach are difficult to predict. This is because the rate of recovery relative to CPI indexation would depend on relative movements between the two indices. In turn, the effect that this will have on each supplier will depend on the average age of their asset base.
- 4.3.80 The main argument against a replacement cost or producer price index is that they lead to counter-intuitive cash flow profiles when revaluation gains are treated as income during price setting. This is because an expected increase in replacement costs above CPI would be associated with a lower level of revenues over a regulatory period. In other words, the faster that the cost of replacing assets increases relative to the CPI, the lower revenues will be to cover those costs. On balance, therefore, the Commission has decided against an approach that involves a replacement cost or producer price index.
- 4.3.81 There are additional arguments against regular replacement cost-based valuations such as ODV or ODRC. These valuation approaches contribute to uncertainty because they can always be challenged (just as regulated suppliers are doing now in the context of establishing initial RAB values) on the grounds that the underlying principles and assumptions (many of which are subjective) are not ‘fit-for-purpose’. By contrast, taking an existing valuation and rolling it forward for actual capital expenditure, depreciation and CPI-indexation—despite some uncertainty inherent in the CPI—provides far more predictable valuation outcomes than periodic replacement cost-based revaluations. Certainly the resulting value is objectively verifiable and auditable *ex post*.
- 4.3.82 In addition, rolling forward RAB values using some form of replacement cost-based approach can potentially result in poor investment incentives. The majority of EDBs still do not support undertaking periodic replacement cost-based revaluations on an ongoing basis under Part 4, and for similar reasons. Just as Powerco did in 2005, ENA cites the ACCC’s view concerning problems with undertaking ODV revaluations (paragraph F4.32), and agrees with the Commission’s reasoning as set out in the EDB Draft Decisions Paper in support of a preference for CPI-indexation (i.e. Indexed Historic Cost, or IHC) over repeated ODVs going forward.²⁶⁷

The ENA recognises it may be possible, in principle, to design a periodic ODV roll forward that better meets the purpose statement requirements relative to the IHC method (taking into account regulatory implementation issues), but such a design has not yet been proposed. ...

In the absence of a well-developed regulatory design that is capable of implementing a periodic ODV method in a manner consistent with the purpose of Part 4, the ENA

²⁶⁷ ENA, *Submission 8, Valuation Input Methodology, Roll Forward of the Regulatory Asset Base*, 20 August 2010, paragraph 37.

recommends the Commission adopt the IHC method, along the lines proposed in the Draft Reasons Paper, to roll forward RAB.²⁶⁸

4.3.83 The main argument advanced in favour of on-going replacement cost-based valuations has been that it is required to promote outcomes consistent with outcomes produced in workably competitive markets. The Commission has rejected this view. Consequently, there are few if any arguments in favour of on-going replacement cost based valuations under Part 4.

Key conclusions with respect to revaluations of the asset base

4.3.84 With respect to the way in which the RAB value could be rolled forward:

- a number of valuation approaches could be consistent with promoting outcomes consistent with outcomes produced in workably competitive markets;
- on-going replacement cost-based revaluations, or some form of replacement cost-based indexation, would appear to be least well suited to a regulatory context;
- there is little to choose between an un-indexed approach and CPI-indexation; but
- on balance, the greater protection against inflation risk that is afforded by CPI-indexation is sufficient reason to prefer such an approach over an un-indexed approach.

Alternative ways in which depreciation can be calculated

4.3.85 While there are a number of benefits associated with CPI-indexed straight-line depreciation, there are also likely to be a limited number of circumstances in which alternative approaches may better meet the Part 4 Purpose. For example, the output or utilisation of an asset may reasonably be expected to vary over time. In workably competitive markets where this is the case, the pricing profile may be adjusted so that consumers pay the same price per unit in real terms over time.

4.3.86 Submitters were generally supportive of straight-line depreciation using physical asset lifetimes as the standard approach to depreciation. However, some considered that different depreciation approaches should be available under a DPP.²⁶⁹ The reason it would not be possible is that these ‘one-size-fits-all’ price-quality paths are not based on a detailed review of the level of depreciation that each supplier expects in future. Thus alternative depreciation rates cannot be accommodated unless a supplier proposes a CPP. In addition, by remaining on the DPP, suppliers are implicitly indicating that they expect to earn revenues that are sufficient—and likely greater—than the revenues implied by CPI-indexed straight-line depreciation.

4.3.87 Allowing suppliers alternative approaches once a DPP has been set provides scope for gaming. This is because if suppliers were allowed to vary depreciation once a

²⁶⁸ *ibid*, paragraphs 41 and 43.

²⁶⁹ Refer, for example, Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, pp. 80-81, paragraphs 244-251.

DPP has been set for them, then they have an incentive to adopt a slower depreciation rate or longer asset lifetime. This would mean that they would recover the same level of revenue during the regulatory period but the remaining RAB value—the amount left to be recovered after the regulatory period—would have increased. This would appear to be inconsistent with limiting suppliers in their ability to extract excessive profits (i.e. inconsistent with s 52A(1)(d)).

- 4.3.88 When proposing a CPP, however, suppliers are free to propose a different depreciation rate, or asset lifetime, for an asset if they considered this would better meet the Part 4 Purpose. Suppliers would need to provide evidence in support of such a proposal. Likewise, if suppliers considered there were any other reasons why depreciation should differ from that implied by CPI-indexed straight-line depreciation then they may propose an alternative in their CPP application, and provide evidence to support this position. The Commission would consider the strength of any such proposal when setting CPP.

CHAPTER 5: TREATMENT OF TAXATION

5.1 Introduction

5.1.1 The IMs relating to regulated electricity lines and gas pipeline services must include the “treatment of taxation” (s 52T(1)(a)(iv)). The IM for the treatment of taxation sets out the methodology that is to be used to determine the regulatory tax allowance for each supplier. This chapter sets out the Commission’s decisions on, and reasons for, the treatment of taxation for each EDB, GDB and GTB.

IM for the treatment of taxation

5.1.2 Tax costs are one of the main types of costs facing all regulated suppliers. They are therefore a key part of any assessment of regulated supplier profitability. Compensation for these costs must also be provided when price-quality paths are set.

5.1.3 In practice, the task of determining the tax costs associated with the supply of a particular type of regulated service is not a straightforward one. This is because, as is discussed in the cost allocation chapter (Chapter 3), many regulated suppliers supply more than one type of regulated service as well as a range of other services that are not regulated under Part 4. Tax is paid to the Inland Revenue Department (IRD) on a whole-of-business basis, and therefore the tax costs associated with the supply of a particular regulated service cannot be determined directly.

5.1.4 The tax costs could be attributed to the supply of regulated services in the same manner as other operating costs—i.e. by applying the cost allocation IM to the tax costs associated with all the suppliers regulated and unregulated services. However, tax costs arise as a consequence of many other operational and capital decisions made by EDBs and GPBs. Applying a tax cost allocation methodology in its own right would therefore be likely to result in an allocation of tax costs that is inconsistent with the other costs allocated to the regulated services.

5.1.5 Tax costs associated with the supply of a particular type of regulated service must consequently be calculated by applying the corporate tax rate to regulatory taxable income. Regulatory taxable income is the total regulatory income *less* expenses associated with the supply of a particular type of regulated service. These expenses are allocated to each regulated service by applying the cost allocation IM, but adjusting for any revenue or expenses not recognised as assessable or deductible under tax legislation (e.g. revaluation gains or losses).²⁷⁰

²⁷⁰ Expenses associated with the supply of a particular type of regulated service are allocated by applying the cost allocation IM.

5.1.6 Thus, the generic expression for estimating tax costs, subject to potential adjustments, will be:

Total Regulatory Income

– Depreciation deduction for regulatory tax purposes

– Other deductions and adjustments for regulatory tax purposes (e.g. deductible opex, interest, permanent differences, and—in some circumstances—amortisation of initial differences and revaluations)²⁷¹

= **Regulatory Taxable Income**

× **Corporate Tax Rate**

= **Regulatory Tax Allowance**

5.1.7 There are three main approaches that could be used to estimate the tax costs facing each regulated supplier. Although the generic formula is very similar in each case, the individual terms—particularly the depreciation deduction for tax purposes—differ.²⁷²

- the ‘tax payable’ approach relies on regulatory tax depreciation. This form of depreciation is conceptually similar to the allowable deduction for depreciation used in calculating the tax payable to the IRD. Rather than calculating regulatory tax depreciation with reference to the value recognised by tax legislation for the relevant assets, however, the regulatory tax asset value is used instead,²⁷³ and
- the other two approaches are variants of the ‘tax expense’ approach and rely on regulatory depreciation (i.e. depreciation of the RAB consistent with the IM for the valuation of assets). The tax expense approach can be implemented either:
 - without any adjustment to the RAB value (i.e. the ‘tax expense’ approach);
 - with a deferred tax balance adjustment to the RAB value before the return *on* capital is determined (i.e. the ‘deferred tax’ approach). As discussed further below (paragraph 5.3.6 to 5.3.9), the deferred tax balance reflects the cumulative difference between the annual tax payable and tax expense amounts.

²⁷¹ The amortisation of initial differences and revaluations is only relevant under a deferred tax approach.

²⁷² An explanation of the main approaches can be found in Section 7.3 of the IM Discussion Paper. Commerce Commission, *Input Methodologies Discussion Paper*, 19 June 2009, Chapter 7.

²⁷³ The regulatory tax asset value may differ from the value recognised under tax rules. For example, as discussed further in Appendix G, the initial regulatory tax asset value will equal the minimum of the value recognised under tax rules for the relevant assets or share of assets used to supply the regulated services, and the initial RAB value.

5.1.8 There are a number of ways in which these high level approaches can be implemented in practice. As discussed further below, it is appropriate to tailor the treatment of taxation in light of the regulatory context and specific statutory objectives.²⁷⁴

Application of the IM for the treatment of taxation

5.1.9 Under information disclosure regulation, the IM for the treatment of taxation only applies to the way in which profitability is reported by suppliers. Interested persons require this information in order to assess whether the Part 4 Purpose is being met. The IM for the treatment of taxation is therefore a key part of satisfying the purpose of information disclosure regulation set out in s 53A. Regulated suppliers will therefore need to provide sufficient information on the assumptions that underpin the tax calculation.

5.1.10 The IM for the treatment of taxation also applies to default/customised regulation. For those suppliers subject to this type of regulation, it is likely to have a bearing on the level of revenue that they can expect to earn. Given that the IM for the treatment of taxation will affect the disclosed profitability of suppliers, it will be indirectly relevant to decisions on what, if any, starting price adjustments would be appropriate under s 53P(3)(b) at the beginning of a DPP. Any regulated supplier that considers an alternative price-quality path would better meet their particular circumstances is able to propose a CPP under s 53Q. The IM for the treatment of taxation must be applied in every proposal.

Overview of the IM and structure of this chapter

5.1.11 Table 5.1 sets out the components of the IM for the treatment of taxation for EDBs and GPBs, and indicates where in this paper each component is discussed.

Table 5.1 Overview of IM for the Treatment of Taxation for EDBs and GPBs

Approach in IM	Where discussed
EDBs and GDBs	
Tax costs must be estimated using a ‘modified deferred tax’ approach. Specification of modified deferred tax approach (e.g. how the deferred tax balance is calculated and cost allocation adjustments are treated).	Section 5.3
When calculating regulatory taxable income, the cost allocation IM and tax legislation (to the extent practicable) are to be used, subject to other relevant provisions in the IMs. Debt interest should be calculated using a notional leverage that is consistent	Appendix G

²⁷⁴ For example, the deferred tax approach is conceptually similar in scope and content to the comprehensive deferred tax accounting approach mandated in International Financial Reporting Standards, which now have equivalents under New Zealand GAAP. Applying GAAP, the deferred tax balance would simply reflect the tax effect of the difference between the RAB value (which might be a revalued amount) and the regulatory tax asset value (which is not revalued). However, complications arise where the RAB is revalued because such an approach would not be consistent with a supplier expecting to earn a normal return over time. This is because the deferred tax balance will reflect but not equal the cumulative difference between the tax expense (calculated in accordance with GAAP) and the tax payable amounts. In this situation, consistency with FCM would require redefining the regulatory tax expense calculation so that—unlike the approach calculated in accordance with GAAP—it fully takes into account the impact of revaluations.

Approach in IM	Where discussed
with the cost of capital IM.	
Tax losses in the wider tax group must be ignored when estimating tax costs.	Appendix G
The regulatory tax asset value of acquired assets should remain unchanged in the event of an acquisition of assets used to supply services that are regulated under Part 4.	Appendix G
The initial regulatory tax asset value in 2009 (as at 31 March) should be the lesser of that recognised under tax rules for the relevant assets or share of assets used to supply electricity or gas distribution services, or the initial RAB value.	Appendix G
The initial deferred tax balance should be zero.	Appendix G
For EDBs only, discretionary discounts and customer rebates should be treated as a tax deductible expense, if allowed under tax legislation, but should not be treated as a cost for the purposes of disclosing or determining regulated revenue.	Appendix G
GTBs only	
Tax costs must be estimated using a tax payable approach	Section 5.3
When calculating regulatory taxable income, the cost allocation IM and tax legislation (to the extent practicable) are to be used, subject to other relevant provisions in the IMs. Debt interest should be calculated using a notional leverage that is consistent with the cost of capital IM.	Section 5.3
Tax losses in the wider tax group must be ignored when estimating tax costs.	Appendix G
The regulatory tax asset value of acquired assets should remain unchanged in the event of an acquisition of assets used to supply services that are regulated under Part 4	Appendix G
The initial regulatory tax asset value in 2009 (as at 31 March) should be the lesser of that recognised under tax rules for the relevant assets or share of assets used to supply gas transmission services, or the initial RAB value.	Appendix G

5.1.12 The chapter is structured as follows:

- Section 5.2 sets out the key considerations in setting the IM for the treatment of taxation; and
- Section 5.3 sets out the Commission’s decisions and reasons for the IM for the treatment of taxation.

5.1.13 Further details about the IM for the treatment of taxation can be found in Appendix G. This appendix briefly discusses the application of the methodology to information disclosure and default/customised price-quality regulation. It also sets out detailed components of the methodology, including:

-
- deductions for regulatory tax purposes;
 - the tax treatment of acquisitions;
 - the establishment of the initial regulatory tax asset value and—where applicable—the initial regulatory deferred tax balance; and
 - the treatment of tax losses.

5.2 Key Considerations in Determining the IM for Treatment of Tax

5.2.1 An IM for the treatment of taxation is intended to promote certainty for suppliers and consumers in relation to the way that tax costs are to be treated for information disclosure purposes and for default/customised price-quality regulation (consistent with s 52R). It must promote this purpose and the Part 4 Purpose in light of the purpose of the relevant regulatory instruments.

Insights from workably competitive markets

5.2.2 Apart from covering capex and opex, efficient suppliers providing services in workably competitive markets will generally expect their revenues to cover the tax costs that arise as a consequence of their business decisions. As a result, in workably competitive markets, it is profits after tax (and taking into account tax imputation in the cost of capital) that would on average be expected to be just sufficient to reward investment, innovation and efficiency.

5.2.3 However, the exact time at which suppliers recover tax costs in workably competitive markets will vary, according to supply and demand conditions prevailing at the time or as determined by longer-term pricing arrangements. Many permutations for cost-recovery are therefore potentially valid, given the particular context, provided suppliers have the opportunity to earn an adequate level of profitability over time (i.e. after having met their tax obligations to the relevant tax authority).

Implications for the treatment of taxation under Part 4

5.2.4 As noted in Chapter 2, the Commission has interpreted ‘profits sufficient to reward investment, innovation and efficiency’ as meaning that its decisions should be consistent with expected profitability levels that are closer to, rather than further from, an expectation of a normal rate of return over time (i.e. FCM). This is reinforced in s 52A(1)(d), which requires that the outcomes promoted under Part 4 must be consistent with outcomes produced in workably competitive markets, such that suppliers are limited in their ability to extract excessive profits.

5.2.5 Further guidance is provided by the other regulatory objectives contained in the Part 4 Purpose (i.e. s 52A(1)(a)-(c)). First, consistent with s 52A(1)(b), a focus on incentives to achieve tax efficiencies on their own ought not to outweigh the consideration of incentives to promote improvements in overall economic efficiency. This is because tax liabilities arise as a result of many other business decisions and as such a move that increases tax costs may be desirable, provided it leads to, or is caused by, a reduction in costs overall. It is difficult to conclude that decisions with very different tax consequences are not equally legitimate. Tax efficiency savings

are therefore only desirable insofar as they are consistent with a reduction in costs overall (i.e. that they are to the long-term benefit of consumers).

- 5.2.6 Secondly, the treatment of taxation should generally be consistent with flat aggregate prices in real terms, unless economic depreciation suggests otherwise.²⁷⁵ The reason the Commission favours a focus on flat aggregate pricing over time is that it is consistent with allocative efficiency in workably competitive markets (i.e. consistent with suppliers having incentives to improve economic efficiency and thus s 52A(1)(b)). As noted by Jeff Balchin at the tax workshop, where all other things are equal (e.g. consumer preferences do not change), the efficient prices for a regulated monopolist subject to a normal profit constraint will be constant prices in real terms.²⁷⁶ When an alternative time profile of returns would better meet the Part 4 Purpose, suppliers are able to propose a variation to regulatory depreciation as part of a CPP proposal (see Chapter 4).
- 5.2.7 A potential issue might arise, however, when the RAB value is inflation indexed and investment needs are increasing. Regulatory cash flows are in effect based on a real return on the value of the RAB, since revaluation gains are treated as income and therefore do not immediately result in a corresponding cash flow. Since debt is usually denominated in nominal terms, it is possible that suppliers' cash flows will not match their debt obligations, potentially raising their financing costs. In these situations, suppliers that are subject to default/customised regulation will always have the option of proposing an alternative price-quality path that better meets their particular circumstances (i.e. increasing investment needs).
- 5.2.8 Where possible, however, it may be desirable to bring forward cash flows for suppliers: for example, by allowing suppliers to recoup their tax costs from consumers before the obligations arise. This may help improve the financeability of investments, at the margin, for suppliers subject to default/customised price-quality regulation. Powerco stressed the materiality of the increased cash flow provided by the deferred tax approach.²⁷⁷
- 5.2.9 Finally, the treatment of taxation can affect incentives to acquire assets. The tax treatment of transactions should recognise that, in workably competitive markets, the efficiency gains from those transactions, assuming such gains eventuate, will be shared with consumers over time, consistent with s 52A(1)(c). On the other hand, in workably competitive markets, risks tend to be allocated to those market participants that are best placed to manage them. This is likely to reduce the overall costs of supply, and therefore be consistent with the long-term benefit of consumers.

²⁷⁵ This contrasts with some submissions, which argued that the treatment of taxation should be consistent with flat regulatory tax allowances in real terms. For example, Vector, *Pre-workshop submissions on process and regulatory tax issues*, 26 January 2010, p. 5.

²⁷⁶ Comments by Mr. Balchin of PwC (on behalf of Powerco), *Transcript - Input Methodologies Tax Workshop*, 8 February 2010, p. 26, line 29. Allocatively efficient pricing is also discussed in W. Baumol, Optimal depreciation policy: Pricing the products of durable assets, *Bell Journal of Economics and Management Science* Vol. 2, 1971, 638-656; and W. Rogerson, Optimal depreciation schedules for regulated utilities, *Journal of Regulatory Economics* Vol. 4, 1993, pp. 5-33.

²⁷⁷ For example, Comments by Mr. Goodeve of Powerco, *Transcript - Input Methodologies Tax Workshop*, 8 February 2010, p. 19, lines 6 to 14.

- 5.2.10 One way to promote outcomes consistent with both of these considerations is to allow the net tax benefits (or costs) of a transaction to be borne by a regulated supplier. These will be more significant in the case of major asset acquisitions rather than share purchases.²⁷⁸ Doing so recognises that a regulated supplier should retain some benefits of the transaction as a reward for improved efficiency and investment, thereby assisting in promoting efficient investment (consistent with s 52A(1)(a) and (b)). It also recognises that regulated suppliers are better placed than consumers to manage the risks should the efficiency gains from the transaction not eventuate as planned. Nonetheless, if there are other efficiency gains achieved through the transaction that are not tax-related, then these should be shared with consumers over time.
- 5.2.11 Thus, the tax effects (i.e. by changing depreciation claimable for tax purposes) of such a sale and purchase between regulated suppliers should not be passed through to consumers but instead should be enjoyed or borne by the suppliers concerned.

5.3 Treatment of Taxation under Part 4

- 5.3.1 A tax payable approach will apply to regulated gas transmission services. The suppliers of these services support this approach. By contrast, the majority of the other regulated suppliers favour a ‘modified deferred tax approach’, as proposed by PwC. This approach will apply to regulated electricity distribution services and gas distribution services. The tax payable and modified deferred tax approaches are NPV-equivalent.
- 5.3.2 The tax expense approach—i.e. without a deferred tax balance adjustment to the RAB value—will not apply to any regulated suppliers because it is not consistent with regulated suppliers expecting to earn profits over time consistent with those expected in workably competitive markets (i.e. it is not consistent with FCM).

Tax payable approach applying to suppliers of regulated gas transmission services

- 5.3.3 The tax payable approach applying to regulated gas transmission services comes closest to approximating the cash flows a supplier would need to meet its tax obligations for any given period. As noted above, this corresponds to the use of regulatory tax depreciation as a deduction for regulatory tax purposes (as opposed to regulatory depreciation). The approach is therefore consistent with suppliers expecting to earn profits that are consistent with, and not excessively above, the profits that would be expected in a workably competitive market.
- 5.3.4 In addition:
- when implemented alongside CPI-indexed straight-line depreciation, the tax payable approach is potentially most consistent with an allocatively efficient time profile of prices over time (i.e. flatter in real terms), consistent with s 52A(1)(b);

²⁷⁸ Unlike sales and purchases of shares, sales and purchases of assets will typically result in the purchaser being able to claim depreciation for tax purposes on the assets based on the purchase price, while the seller may be subject to clawback of depreciation where the proceeds exceed the depreciated tax asset value.

- the tax payable approach is consistent with suppliers having incentives to pursue overall improvements in efficiency, consistent with s 52A(1)(b), whilst not disincentivising any improvements in tax efficiency that would be to the long-term benefit of consumers;
- as discussed in paragraphs G2.13 - G2.24 in Appendix G, a tax payable approach can be implemented in a way that the supplier retains the net tax benefits (or costs) of the transaction, thereby promoting incentives for efficiency-enhancing trades, while protecting consumers from the downside of transactions that do not achieve the expected gains;
- the approach is relatively simple to understand and implement; and
- the approach was supported by both suppliers of regulated gas transmission services.²⁷⁹

Deferred tax approach applying to all other regulated suppliers

5.3.5 For all other regulated suppliers, the regulatory tax allowance must be calculated using a tax expense approach with a modified deferred tax balance adjustment to the RAB value (i.e. ‘modified deferred tax approach’). This corresponds to the use of regulatory depreciation—rather than regulatory *tax* depreciation—as a deduction for regulatory tax purposes.

5.3.6 In the absence of a modified deferred tax balance adjustment to the RAB value, the tax expense approach would result in suppliers over-recovering their tax costs from consumers over time. This is because consumers would effectively pay cash to the company on new investments in advance of the company needing the money to pay its tax obligations.²⁸⁰ Suppliers would be able to invest the surplus cash until it is needed, and earn a return equivalent to their cost of capital on that amount in the intervening years before the tax costs materialise. At the end of the asset’s lifetime, after accounting for this ‘interest’, the business will have received more money from consumers than was needed to pay off the tax obligations associated with the supply of the regulated service.

5.3.7 The tax expense approach must therefore be implemented alongside an adjustment to the RAB value in order to be equivalent in NPV terms to the tax payable approach. The reason for this is that an adjustment to the RAB value affects the return *on* capital that suppliers can expect to earn in future. A downward adjustment to the RAB value therefore means that consumers will pay lower prices going forward than they otherwise would have done. In effect, these lower prices are the mechanism by which a supplier repays the debt that it owes to consumers. Of course,

²⁷⁹ Vector has noted that it would “prefer to have a tax payable approach applied to its gas transmission business”. Refer: Vector, *Submission in response to the Commerce Commission's Revised Draft Determinations and Consultation Update Papers for Electricity Distribution Businesses and Gas Pipeline Businesses (Part 5)*, 19 November 2010, p. 12. For MDL, refer: Maui Development Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 11, paragraph 8.5.

²⁸⁰ The reason that consumers pay suppliers cash before they need it to pay their tax obligations is that regulatory depreciation is below tax depreciation in the initial years of an asset's lifetime. Hence prices that are based on regulatory depreciation will be higher than they would be if the benefits that suppliers enjoy through accelerated tax depreciation were reflected in pricing.

if suppliers are under-recovering their tax costs from consumers, then an upward adjustment would need to be applied to the RAB value.

- 5.3.8 The adjustment to the RAB value cannot, however, be calculated in the same way that a deferred tax balance is calculated for financial reporting purposes (i.e. using deferred tax approaches that are consistent with NZ IAS 12). This is because any deferred tax approach for regulatory purposes is intended to be NPV-equivalent to the tax payable approach. This NPV-equivalence does not hold when the deferred tax balance is calculated in accordance with NZ IAS 12. Under these accounting rules, the tax effect of revaluations does not affect the profit/(loss) in the year that a revaluation occurs. Moreover, the deferred tax balance effects of changes under accounting rules may also result in significant divergence from NPV-equivalence.²⁸¹
- 5.3.9 A ‘modified’ deferred tax approach would however be potentially appropriate, provided it was consistent with suppliers expecting to earn a normal rate of return over time. When compared to the other main NPV-neutral approach—i.e. the tax payable approach—the modified deferred tax approach results in greater up-front cash flows for suppliers in respect of new investments. This has been argued to be an appropriate approach for the majority of regulated suppliers, as it would be expected to bring forward the rate at which suppliers are able to recover the value of their investments under default/customised price-quality regulation (consistent with s 52A(1)(a)). It will also ensure that—under information disclosure regulation—interested persons are able to assess whether regulated suppliers are limited in their ability to extract excessive profits, consistent with s 52A(1)(d).
- 5.3.10 One such modified deferred tax approach was developed by PwC (on behalf of the ENA) and presented at the tax workshop attended by a number of regulated suppliers. A variety of modified approaches that are NPV-neutral are also potentially feasible: for instance, the alternative deferred tax approaches that were at one stage of the consultation process proposed by Vector and by CRA (on behalf of Unison). The Commission is satisfied however that since the PwC approach appears to be supported by the majority of regulated suppliers, it is an appropriate way of ensuring that their preferred deferred tax approach is NPV-equivalent to the tax payable approach.²⁸²
- 5.3.11 Thus, a modified deferred tax approach will apply to regulated electricity distribution and gas distribution services, in which NPV-equivalence with the tax payable approach has been ensured by:
- determining the asset value used for assessing profitability under information disclosure regulation, or for setting allowable revenues under price-quality regulation, as the RAB value plus the deferred tax balance;

²⁸¹ For example, the recent change in the corporate tax rate will require the deferred tax balances disclosed for financial reporting purposes to be revalued, in accordance with NZ IAS 12. Given that the corporate tax rate has reduced from 30% to 28%, the value of any deferred tax liability will have been reduced. Under the modified deferred tax approach proposed by the Commission, however, the regulatory deferred tax balance should not be revalued, as doing so would breach the NPV-equivalence of the method.

²⁸² NPV-equivalence requires that the temporary differences that would be recognised under the tax payable approach are equally recognised under the deferred tax approach when calculating the deferred tax balance.

- the deferred tax balance is, in broad terms, calculated using the cumulative differences between the supplier's estimated 'tax payable' to the IRD in each period and the regulatory tax allowance calculated using the modified tax expense calculation. The modified approach excludes the tax effect of revaluations from the deferred tax account and takes the amortised portion to regulatory profit/(loss) in each year over the average remaining useful life of the revalued asset base.²⁸³ To avoid double-counting, the depreciation timing differences that flow through to the deferred tax balance then exclude any depreciation on revaluations,²⁸⁴
- as well as amortising any future revaluations over the residual lifetime of the assets, the modified deferred tax approach requires amortisation of the difference between the initial RAB and the initial regulatory tax asset value over the same time period.²⁸⁵ The tax effect of both the amortisation terms will increase the regulatory tax allowance recovered from consumers each year;
- the amortisation of the difference between the initial RAB value and the initial regulatory tax asset value is taken to regulatory profit/(loss), with the tax effect being added to the deferred tax account; and
- like the tax payable approach, an adjustment is required to the tax asset value to reflect annual changes in asset allocation (i.e. due to cost allocation). In light of these adjustments, an additional annual change is required to the deferred tax balance. This ensures that the tax effects of differences between the two asset bases are exactly reversed over the lives of the assets. The value of this adjustment is the tax effect of the dollar value difference between the change in the closing regulatory asset values and the change in the regulatory tax asset values as a result of the reallocation.

5.3.12 This approach is unlikely to be as readily understood by interested persons as the tax payable approach. This is because PwC's approach is unique: it is not consistent with GAAP and it appears to be used by no other regulators in jurisdictions overseas. In this respect, the tax payable approach is likely to better meet the purpose of information disclosure regulation in s 53A.

5.3.13 Greater weight should, however, generally be given to dynamic efficiency, consistent with s 52A(1)(a), than allocative efficiency, and the modified deferred tax

²⁸³ This contrasts with a deferred tax approach based on NZ IAS 12, which requires the total tax effect of a revaluation to be posted to the deferred tax account (with no current year adjustment to the profit/(loss)) and then be reversed through depreciation timing differences over time. Under the modified approach, regulatory taxable income is determined by applying the cost allocation IM, and adjusting for the amortisation of the revaluations, and the amortisation of the difference between the initial RAB value and the initial regulatory tax asset value, and adjusting for any revenue or expenses not recognised as assessable or deductible under tax legislation.

²⁸⁴ The regulatory deferred tax balance is updated each year for the tax effect of timing differences—including the difference between regulatory depreciation and regulatory tax depreciation—and of the amortisation adjustments.

²⁸⁵ As noted by Mr. Wattie (PwC) on behalf of the ENA at the Tax Workshop, indexation of the RAB value will lead to a divergence between the RAB value and the tax asset value by the amount of the indexation: "that indexation will never be deductible for tax purposes, but it will be an expense to be recovered from customers in our regulatory revenue statement. So for tax purposes we ... effectively amortise the revaluation amount over the life of the asset as what would have been previously known as a permanent difference. And again it reflects the fact that for regulatory purposes we will have a depreciation amount higher than for tax purposes." Refer: Comments by Mr. Wattie of PwC (on behalf of the ENA), *Transcript - Input Methodologies Tax Workshop*, 8 February 2010, p. 7, line 29 to p. 8, line 4.

approach has been argued to have some desirable dynamic efficiency properties. Nonetheless, as is discussed above, the cash flow benefits of the modified deferred tax approach are not only associated with new investment, which is relevant to s 52A(1)(a), but to cash flows associated with existing assets as well. The latter effect is not required to improve the financeability of new investments (i.e. to be consistent with s 52A(1)(a)), and could potentially result in price shocks for consumers when the approach is first introduced.

- 5.3.14 The net effect on a supplier's cash flow of the modified deferred tax approach could be positive or negative relative to the tax payable approach. This is because the difference between regulatory depreciation (excluding depreciation on revaluations) and regulatory tax depreciation will depend on the average age of assets in the RAB.
- 5.3.15 For the majority of regulated suppliers, the net effect associated with applying the modified deferred tax approach to past assets is expected to be positive. Some regulated suppliers with an older asset base may, however, be comparatively less well off, in cash flow terms, under the modified deferred tax approach than under the existing tax payable approach. The two approaches are nevertheless equivalent in NPV terms to suppliers.
- 5.3.16 Despite a number of drawbacks with the modified deferred tax approach—particularly in respect of its complexity—it is, like the tax payable approach applying to regulated gas transmission services, an acceptable approach under Part 4. Given its strong support by most of the industry, a modified deferred tax approach will apply to all EDBs and GDBs. This concession to the submissions of those regulated suppliers is based on the affected regulated suppliers meeting the deferred tax obligation to consumers in the future where the deferred tax balance is a liability.

CHAPTER 6: COST OF CAPITAL

6.1 Introduction

6.1.1 Section 52T(1)(a)(i) requires the IMs relating to a particular good or service to include, to the extent applicable under the relevant type of regulation, an IM for the cost of capital. This chapter summarises the IM for estimating the cost of capital, its key parameters, and the reasoning which underpins the cost of capital IM.

An IM for estimating the cost of capital

6.1.2 The IM sets out how the Commission is to estimate a cost of capital for regulated services. The cost of capital is the financial return investors require from an investment given its risk. Investors have choices, and will not invest in an asset unless the expected return is at least as good as that they would expect to get from a different investment of similar risk. The cost of capital is an estimate of that rate of return.

6.1.3 There are two main types of capital: debt and equity capital. Both have a cost. For debt, it is the future interest payments. For equity, it is the expectation of dividend payments by the firm, and where profits are retained and reinvested, the expectation of larger dividend payments by the firm some time in the future. The cost of capital reflects the cost of debt and the cost of equity, and the respective portion of each that is used to fund the investment.

6.1.4 The cost of capital, in particular the cost of equity, cannot be observed directly.²⁸⁶ Rather it must be estimated from the available data using a number of tools and techniques. This is not a simple task. The available tools are imperfect, the data can be hard to obtain or unreliable, and can change over time. Older data can be re-interpreted in new ways; newer data may call into question previous assumptions. The cost of capital is forward-looking. That is, it reflects expectations of the returns required in the future, which cannot be observed in advance.

6.1.5 In estimating the cost of capital, there are also choices around the analytical models to be used, over the level of each parameter, and around the estimate of the cost of capital to be applied under the different regulatory instruments. The estimation of a cost of capital is not a mechanical task. To determine the methodology for estimating the cost of capital, and to assure itself that the estimate is reasonable and meets the Part 4 Purpose and the purpose statements for information disclosure regulation and price-quality regulation, the Commission has had to exercise a degree of judgement over these matters. The Commission has carefully considered the effect of a number of choices individually and in combination. The Commission has used its IM to estimate the cost of capital based on current market conditions. It has then tested the resulting estimate of the cost of capital against a range of market information to ensure the IM is reasonable and commercially realistic, in the context of how the cost of capital is to be applied in regulation under Part 4.

²⁸⁶ The cost of equity, expressed as a rate of return, is the discount rate implicit in the price at which equity can be raised (given the investors' expectations of future cash flows which they will derive or have claim to). This discount rate cannot be directly observed or calculated because the investors' true expectations cannot be directly observed.

Application of the IM

- 6.1.6 The cost of capital IM specifies how the cost of capital will be determined. The cost of capital varies between different services. Those regulated suppliers that supply more than one type of regulated service will have a cost of capital for each service.
- 6.1.7 The cost of capital IM does not specify the cost of capital for a regulated service directly. Rather, it sets out the methodology for determining the cost of capital for each service. Some parts of the IM specify values for certain parameters, such as tax rates, while other parts specify a methodology for obtaining estimates where information is constantly changing, such as interest rates.
- 6.1.8 The cost of capital as set out in the IM comprises two parts. The first and most significant component is the weighted average cost of capital (WACC). The WACC is determined for each regulated service and applies to all regulated suppliers of that service. The second component is the term credit spread differential, which is treated as a separate component because it will apply to qualifying firms only. Although it is conceptually a component of the cost of capital, for the purposes of this IM it is treated as an adjustment to cash flows (under information disclosure and DPP) and an allowable building block revenue (under CPP).
- 6.1.9 The IM will be used to produce estimates of the cost of capital for regulated services. The estimate of the cost of capital will be used to assess the profitability of regulated suppliers and as an input in setting price-quality paths.

Overview of IM and structure of this chapter

- 6.1.10 There are many complex, technical issues in developing a methodology for determining the cost of capital. Rather than addressing all of these issues fully in this chapter, these issues are discussed in detail in Appendix H to this document, which should be read together with this chapter. Similarly, detailed references to sources are set out in Appendix H and are kept to a minimum in this chapter.
- 6.1.11 Table 6.1 sets out the components of the IM for the cost of capital for all regulated suppliers, and indicates where in this paper each component is discussed.

Table 6.1 Overview of IM for the Cost of Capital for EDBs and GPBs

Approach in IM	Where discussed
The cost of capital is an estimate of firms' WACC which reflects the cost of debt and the cost of equity used to fund investment. A different WACC will apply in respect of the supply of regulated services by EDBs and GPBs.	Sections 6.1, H1, H2
The Commission will publish annually for all regulated suppliers: <ul style="list-style-type: none"> • a mid-point estimate of the five year post-tax WACC and vanilla WACC to apply under information disclosure regulation; and • an estimate of the five year vanilla WACC at the 75th percentile to apply in setting DPPs and CPPs under default/customised price-quality regulation. Three and four year equivalent estimates of the vanilla WACC at the 75 th percentile will also be published as required for CPPs, and estimated WACC ranges for the 25 th to the 75 th percentiles for both the post-tax WACC and the vanilla WACC will be published to inform interested persons.	Sections 6.7, H14

Approach in IM	Where discussed
<p>The methodology for estimating a vanilla WACC is: <i>cost of debt</i> × <i>leverage</i> + <i>cost of equity</i> × (1- <i>leverage</i>)</p> <p>The methodology for estimating a post-tax WACC is: <i>cost of debt (after corporate tax)</i> × <i>leverage</i> + <i>cost of equity</i> × (1- <i>leverage</i>)</p>	<p>Sections 6.7, H2</p>
<p>For all regulated suppliers, the cost of debt is estimated as: <i>risk free rate</i> + <i>debt premium</i> + <i>debt issuance costs</i></p> <ul style="list-style-type: none"> • the risk free rate is estimated by the Commission as part of publishing annual WACCs for all regulated suppliers. The risk free rate is estimated from the observed market yield to maturity of benchmark vanilla New Zealand Government NZ\$ denominated nominal bonds with a term to maturity that matches the term of the regulatory period (typically five years); • the debt premium is also estimated by the Commission as part of publishing annual WACCs for all regulated suppliers as the difference between the risk free rate and the yield on publicly traded corporate bonds for EDBs and GPBs with a S&P long-term credit rating of BBB+ and a term to maturity which matches the regulatory period (typically five years); and • debt issuance costs are 35 basis points (0.35%) p.a. 	<p>Sections 6.3, H2</p> <p>Sections 6.3, H4, H14</p> <p>Sections 6.3, H5, H14</p> <p>Sections 6.3, H5</p>
<p>A separate term credit spread differential allowance is calculated for qualifying suppliers reflecting the additional costs associated with holding a longer-term debt portfolio. The term credit spread differential is used to adjust cash flows in ID and DPP regulation and is applied to allowable revenue calculations in CPP regulation. Qualifying suppliers are suppliers which have a debt portfolio with a weighted average original tenor exceeding the length of the regulatory period.</p>	<p>Sections 6.1, 6.3, H6</p>
<p>Cost of equity is estimated using the simplified Brennan-Lally CAPM as: <i>risk free rate</i> × (1- <i>investor tax rate</i>) + <i>equity beta</i> × <i>TAMRP</i></p> <ul style="list-style-type: none"> • the risk free rate is the same as for the cost of debt; • the equity beta for EDBs and Transpower is 0.61 and for GPBs is 0.79, derived from: <ul style="list-style-type: none"> ○ an asset beta for EDBs of 0.34 and for GPBs of 0.44; and ○ leverage of 44% for EDBs and GPBs; • the investor tax rate is the maximum prescribed investor tax rate under the PIE tax regime, which is 30% until 30 September 2010 and 28% thereafter. Changes in the prescribed rate will flow through to future WACC estimates automatically; and • the TAMRP is 7.5% until 30 June 2011 and 7% thereafter. The TAMRP is expressed as a five-year composite rate (to match the term of the regulatory period), hence the TAMRP estimated for the five year period which commences on 1 July 2010 is 7.1% and for the five year period which commences on 1 July 2011 is 7%. 	<p>Sections 6.4, 6.5, H2</p> <p>Section 6.3</p> <p>Sections 6.5, H8</p> <p>Sections 6.5, H8</p> <p>Sections 6.6, H3</p> <p>Sections 6.5, H10</p> <p>Sections 6.5, H7</p>

Approach in IM	Where discussed
The corporate tax rate is 30% up until the end of the 2011 tax year, and 28% thereafter. Changes in the corporate tax rate will flow through to future post-tax WACC estimates automatically.	Sections 6.5, H10
To incentivise efficient investment in regulated services (given the possibility of error in estimating the WACC) the WACC to apply for DPPs and CPPs is specified as the 75 th percentile estimate of the WACC.	Sections 6.7, H11
The Commission has compared the estimated WACCs under the IM against a range of other financial and economic information in order to check that the application of the cost of capital IM produces commercially realistic estimates of WACC for EDBs and GPBs.	Sections 6.8, H13

6.1.12 The rest of this chapter is structured as follows:

- Section 6.2 discusses the key considerations the Commission has had regard to in setting the IM;
- Section 6.3 discusses the cost of debt, with technical detail on the risk-free rate, debt premium and debt issuance costs, and the term credit spread differential discussed in separate sections of Appendix H;
- Section 6.4 discusses the model for estimating the cost of equity;
- Section 6.5 applies the preferred model for estimating the cost of equity. Technical detail on the tax-adjusted market risk premium, asset and equity betas, debt betas, and tax, are discussed in separate sections of Appendix H;
- Section 6.6 discusses leverage;
- Section 6.7 discusses the estimation of a WACC range; and
- Section 6.8 describes how the Commission tested the estimates of the cost of capital produced by the cost of capital IM to ensure they are reasonable.

6.1.13 Three further appendices to this paper discuss the overall approach and framework for estimating the cost of capital; the treatment of asymmetric risks; and the application of the cost of capital IM.

6.2 Key Considerations in Determining the Cost of Capital IM

6.2.1 In setting the cost of capital IM the Commission considered the Part 4 Purpose. The Part 4 Purpose is to promote long-term benefit of consumers by promoting outcomes consistent with outcomes produced in workably competitive markets. The cost of capital IM seeks to ensure expectations are for a normal rate of return similar to that expected in workably competitive markets for activities of comparable risk, such that the Part 4 Purpose is met.

Insights from workably competitive markets

- 6.2.2 The cost of capital is the expected rate of return that will attract investment. It is the expected rate of return at which investors are willing to invest, because this expected return is as good as they can get from the range of investment choices with similar risk. Investors can hold a range of investments to limit their risks through diversification. To well-diversified investors, only the risks that affect all investments matter; the risks specific to just one investment can be expected to offset one another and are therefore of little consequence. The return they seek reflects the effect of each investment on the risk of the overall portfolio, not the risk of a single investment viewed in isolation.
- 6.2.3 The actual rate of return may differ to the expected return. Market and economic developments will tend to differ from the expected course of events, and factors such as a successful or unsuccessful new product, decisive or indecisive management actions, or effective or ineffective competitors may result in better or worse than expected returns. However, where a business faces workable or effective competition, a period of returns above the cost of capital cannot be expected to last. The supplier which is earning returns above the cost of capital can attract capital to expand and at the same time other suppliers, eager to maintain their market share and to maximise their own profits, compete hard to catch up. Active and discriminating consumers seek the best deal they can, wherever they can. Through a combination of these processes the superior returns can be expected to erode, and actual returns trend towards a normal rate of return – the cost of capital.
- 6.2.4 Returns in excess of the cost of capital, are a signal for new investment to occur. In workably competitive markets, investors actively seek new opportunities to invest. In particular, such investors seek opportunities where the expected returns are in excess of the cost of capital. This new investment may be by an existing supplier or by new suppliers, and this new investment increases the supply of services into the markets for the services thus placing downward pressure on returns. Conversely, where expected returns are lower than the cost of capital, some suppliers may exit the industry and invest elsewhere, rather than continue to supply services where the returns are too low.
- 6.2.5 Firms in workably competitive markets are price-takers not price makers. In such markets, firms cannot expect to earn returns above the cost of capital for an extended period. Nor can firms expect to dictate to the market what the rate of return will be. A firm pricing its product on the basis of its own excessive (i.e. inefficient) estimate of the cost of capital will lose sales and profits to competitors. In workably competitive markets, the price of products is determined by the cost of capital for suppliers in general, not by the cost of capital for an individual supplier. This is particularly relevant where a supplier has constraints on its capital structure. These constraints may elevate the estimated cost of capital for such suppliers above the cost of capital at which less constrained suppliers can access capital. A supplier which sets prices based on a higher estimate of its cost of capital than the actual cost at which capital is available in an industry cannot expect consumers to pay these higher prices. In workably competitive markets, inefficient costs (of capital or otherwise) are borne by the supplier, not the consumer.

6.2.6 Firms in workably competitive markets continue to innovate and invest as this offers the prospect of improved returns, even if the benefits are eventually competed away. And investors remain willing to invest so long as the returns are as good as those available from comparable investments elsewhere.

6.2.7 In summary, a key outcome from workably competitive markets is that it is the market's view of the cost of capital that matters, not the cost of capital specific to one producer, or a producer's view of the cost of capital. Further, where investors choose to have a diversified portfolio of returns, they care principally about how an investment contributes to the risk of their overall portfolio, rather than the specific risks which affect a single investment (as that can be diversified away).

Developing a robust cost of capital methodology

6.2.8 The Commission has taken a number of steps to develop a robust and workable methodology to estimate the cost of capital. In addition to the rounds of consultation outlined in Chapter 1 and Appendix A (which included a two day workshop specific to the cost of capital), these steps included:

- seeking independent expert advice on the cost of capital from a Cost of Capital Expert Panel (described in Chapter 1 at paragraphs 1.4.18 - 1.4.25);
- consideration of the published literature on cost of capital issues; and
- testing the Commission's conclusions on the level of individual parameters, and its estimate of the overall WACC, against a range of financial and economic information.

6.2.9 The results of that extensive programme of work, and extensive consultation process, is summarised in this chapter and the IM Determinations.

6.3 The Cost of Debt

6.3.1 Debt is a source of capital for many firms. The cost of debt to a firm can be expressed as the sum of the risk-free rate – the rate at which the New Zealand Government can borrow – and the additional debt premium above the risk-free rate the firm must pay due to a lender's assessment of the firm's risk of default compared to the risk-free rate. The IM also includes an allowance for the costs of issuing debt. So the cost of debt is as follows:

$$\text{Cost of debt} = \text{risk-free rate} + \text{debt premium} + \text{debt issuance costs}$$

6.3.2 Each component is discussed in turn below.

Risk-free rate

6.3.3 A risk-free rate is the rate of interest expected when there is no risk of default. Debt issued by the New Zealand Government and denominated in New Zealand dollars is considered to be free of default risk. The rate of interest on Government issued debt can generally be readily observed from the trading on the debt market.

- 6.3.4 The cost of capital is an input into DPPs and CPPs. To ensure the cost of capital is consistent with the period of application of the regulatory instrument in which it will be applied, the term of the risk-free rate must be the same as the regulatory period. For most applications, this means a term of five years, though a three year or four year term will be required where a CPP applicant seeks a three or four year CPP.
- 6.3.5 The risk-free rate may either increase with term or decrease with term. When the risk-free rate declines with term, there is said to be an ‘inverse yield curve’. New Zealand has had an inverse yield curve for significant periods in the past. At present New Zealand has a ‘positive yield curve’. That is, Government bonds with a longer term to maturity have a higher yield than Government bonds with a shorter term to maturity (for example, 10 years versus five years). Higher long-term rates may be due to the uncertainty about future short-term rates or an expectation that future rates will rise, or uncertainty about the future inflation and thus the real return on Government bonds.
- 6.3.6 With a positive yield curve, (as New Zealand currently has) it is in the interests of suppliers for the estimates of the cost of capital to be based on a longer term rate, but the opposite would be the case when there is an inverse yield curve.
- 6.3.7 The term of the risk-free rate should match the regulatory period because if the term of the risk-free rate is longer than the regulatory period and there is a positive yield curve, regulated suppliers will be compensated for risks they do not bear. Conversely, if there is an inverse yield curve, regulated suppliers will be under-compensated if the term of the risk-free rate is longer than the regulatory period.
- 6.3.8 Submissions from a number of suppliers sought a term that was longer than the regulatory period (for example, a 10 year term). In essence, the arguments were that:
- regulated supplier’s assets had a long life and firms generally seek to finance such assets with longer maturity debt (that is, longer than the regulatory period); and
 - some firms have issued a portion of their debt with a maturity exceeding five years to manage their re-financing risks.²⁸⁷
- 6.3.9 Therefore, according to submissions from suppliers, the term of the risk-free rate and debt premium which matches the regulatory period is too short and would under compensate suppliers. However, these submissions overlook: (i) the ability of regulated suppliers to reset prices at the end of the regulatory period to compensate for changes in risk-free rates; and (ii) the widespread use of interest rate swaps. These are now discussed.

²⁸⁷ Based on data received from regulated suppliers during 2009, the Commission estimates only three of the 32 responding regulated suppliers had debt portfolios with an average original term to maturity which exceeded five years. In the 2010 survey, five of the 29 responding regulated suppliers had debt portfolios with an average original term to maturity which exceeded five years.

The power to reset prices

- 6.3.10 Regulated suppliers can reset their prices at the end of each regulatory period to reflect, among other things, changes in the risk-free rate if this has altered the cost of capital. Through the regular resetting of prices the uncertainty over the level of long-term interest rates is borne by users, rather than suppliers. Accordingly, suppliers' prices should not reflect a premium for the uncertainty of risk-free rates beyond the length of the pricing period.
- 6.3.11 The cost of capital IM provides for changes in risk-free rates and the debt premium to be reflected in updated estimates of the cost of capital. For suppliers subject to a DPP or CPP (or an IPP) this will occur at the start of each new regulatory period for each new DPP or CPP.

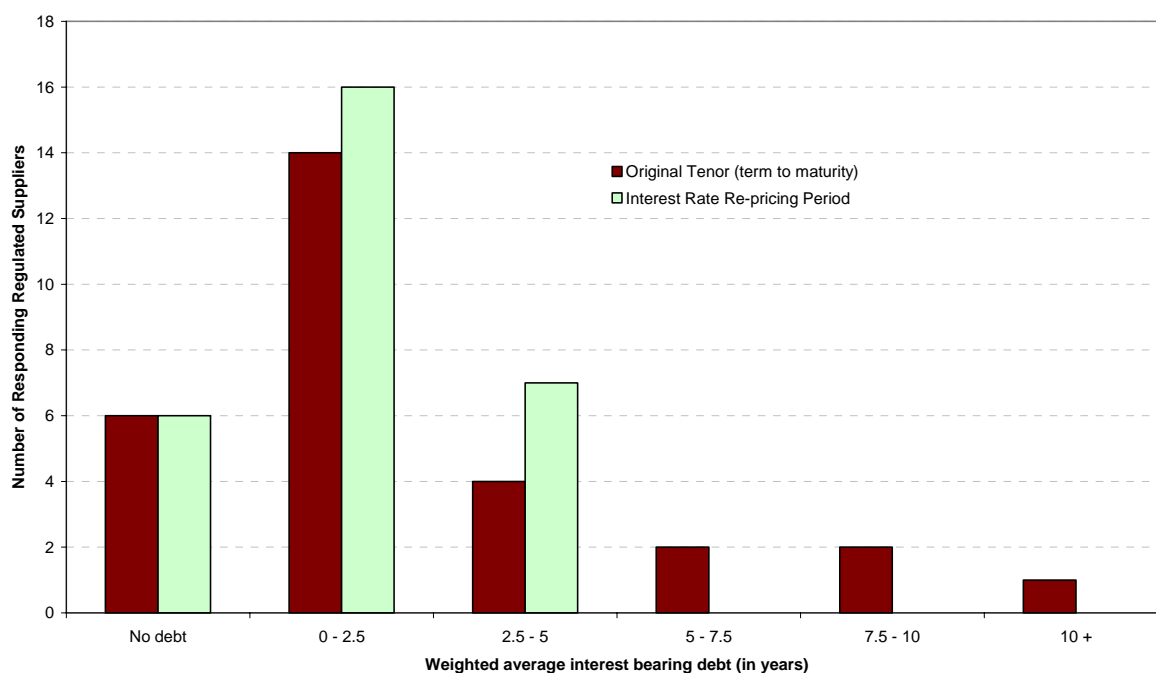
The availability of interest rate swaps

- 6.3.12 Firms have a mix of debt maturities to manage re-financing risk, including issuing long-term debt. This spreads a firm's re-financing requirements over a longer period and reduces the amount of debt that needs to be re-financed in any one year. Reducing re-financing risks has benefits for consumers, but long-term debt typically has a greater cost than medium or short-term debt.
- 6.3.13 The use of fixed-rate long maturity debt would, in the absence of a swap market, fix a firm's interest rate for the term of the loan, say 10 years.²⁸⁸ But many firms do not want their interest rate fixed for 10 years, especially when the rate of interest on shorter-term debt is typically lower. Therefore the firm will use an interest rate swap, typically at the same time as the debt finance is raised, to shorten the period for which their interest rate is fixed. This can result in a lower rate of interest – the trade-off being that the firm does not know what interest rates will be at the time of the re-pricing.
- 6.3.14 The use of interest rate swaps allows the firm to choose the interest rate re-pricing period it faces, independently of the maturity date of the debt. For example, Transpower explained at the Cost of Capital Workshop that its target interest rate re-pricing period was 2 years, even though it raises debt capital with a longer maturity.
- 6.3.15 Interest rate swaps are widely used. This was evidenced in the information on debt profiles that the Commission obtained from regulated suppliers. Specifically, this showed that regulated suppliers were using swaps extensively to shorten their interest rate repricing periods.
- 6.3.16 Figure 6.1 compares the weighted average original tenor for regulated suppliers' debt with the weighted average interest rate re-pricing period for that debt.²⁸⁹ The chart illustrates that due to the use of interest rate swaps, suppliers' choice of interest rate re-pricing period is independent of the tenor of the debt. Firms with long maturity debt had chosen interest rate re-pricing periods that were significantly shorter. No firm had an average interest rate re-pricing period which exceeded five years (even if the tenor of their debt was longer).

²⁸⁸ A small number of New Zealand firms have issued bonds with floating rates of interest.

²⁸⁹ Tenor refers to the original term to maturity of a tranche of issued debt.

Figure 6.1 Regulated Suppliers' Debt Portfolios: Tenor vs. Interest Rate Repricing Period (2010)



6.3.17 The data on the actual interest rate re-pricing faced by regulated suppliers illustrates regulated suppliers' ability to use swaps to alter their interest rate re-pricing period, and to set it to a term consistent with or shorter than the regulatory period. As such, it is inappropriate to set the term of the risk-free rate longer than the term of the regulatory period (and that it should not be set at 10 years). That is, doing so would (assuming a positive yield curve) over-compensate suppliers as they would receive a (higher) risk-free rate in their regulatory cost of capital when their actual interest costs have been re-priced to a much shorter term (lower rate) by the use of interest rate swaps.²⁹⁰

6.3.18 A number of New Zealand monopoly suppliers who are free to determine their own prices use a term for the risk-free rate which matches the pricing period, when estimating their own cost of capital. For example, Airways Corporation uses a five year risk-free rate in its estimate of its cost of capital²⁹¹ and a number of airports (e.g. Hamilton, AIAL, CIAL²⁹²) adopt a five year term for the risk-free rate in their estimates of the cost of capital, which corresponds with the length of their pricing agreements.

²⁹⁰ The cost of entering an interest rate swap is included in the term credit spread differential allowance in respect of long-term debt. (See Appendix H6).

²⁹¹ Airways Corporation, *Pricing Proposal 2009/10 Air Navigation Service Charges for Aircraft 5 Tonnes and under Supporting Information Pack*, at p.2. Airways Corporation, *Statement of Corporate Intent 2010/11 – 2012/13*, at p.11.

²⁹² Hamilton International Airport, *Landing Charges Pricing Methodology*, March 2008, at p.15. Auckland International Airport Limited, *Identified Airport Activities Disclosure Financial Statements for the year ended 30 June 2009*, at p. 42. Christchurch International Airport Limited, *Disclosure Financial Statements for the year ended 30 June 2009*, at p. 42.

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- 6.3.19 The risk free rate of return is estimated by the Commission as part of publishing annual WACCs for all regulated suppliers.
- 6.3.20 A more detailed discussion of issues around the risk-free rate is included in Appendix H4.

Debt premium

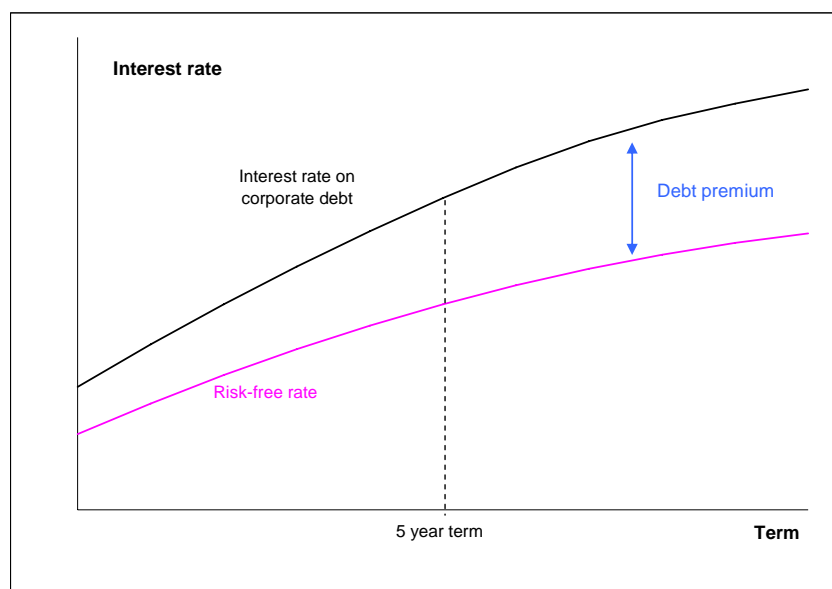
- 6.3.21 The second component of the cost of debt, which is added to the risk-free rate, is the debt premium. The debt premium reflects the additional risk an investor is exposed to when lending to a borrower other than the government. The size of the debt premium principally depends on the creditworthiness of the borrower, but also reflects the inferior liquidity of corporate bonds relative to Government bonds. Financially strong firms can borrow at a lower debt premium than weaker firms or financially distressed firms.
- 6.3.22 There are potentially significant costs and risks to consumers if a supplier becomes financially distressed. For example, a supplier in financial distress may curtail maintenance spending or reduce or defer efficient investment in network assets. This, in turn, may adversely affect the quality and reliability of service experienced by consumers. Excessive levels of debt are not in the long-term interests of consumers.
- 6.3.23 Credit ratings are an indication of a borrower's creditworthiness. The higher the rating, the lesser the assessed likelihood of default. A notional rating is specified as if suppliers' actual credit-ratings were used, they would have an incentive to increase gearing with adverse implications for consumers.
- 6.3.24 Standard & Poors minimum long-term credit rating to be considered investment grade is BBB-. The Commission considers the debt premium should be estimated by reference to a bond with a Standard & Poors' long-term credit rating of BBB+ (or equivalent rating from another recognised agency). A Standard & Poors long-term credit rating of BBB+ is sufficiently high to ensure there is an adequate buffer against the possibility that economic downturns or shocks can lead to financial distress, whilst providing regulated suppliers with some flexibility over the level of gearing and the choice of debt instruments.
- 6.3.25 New Zealand has only a limited number of bonds that are publicly traded. This can make it difficult to estimate accurately the debt premium for an EDB or GPB with a credit rating of BBB+ and a remaining term to maturity of five years. The IM Determination allows the Commission to consider a wider range of credit ratings and issuers than just BBB+ rated bonds issued by an EDB or GPB, when estimating the debt premium. This is discussed more fully in Appendix H5.
- 6.3.26 The debt premium is estimated by the Commission as part of publishing annual WACCs for all regulated suppliers.

The greater debt premium on long-maturity debt

- 6.3.27 The debt premium always increases with the original term to maturity (even if there is a negative yield curve). The increase in the debt premium as term increases is illustrated in Figure 6.2 below. The risk-free rate is shown as the lower line in the

graph, while the debt premium is the gap between the total cost of debt (the top line) and the risk-free rate.

Figure 6.2 The Relationship Between the Debt Premium and Term



- 6.3.28 As discussed above, firms use interest rate swaps to shorten the interest rate re-pricing period of the risk-free part of the interest rate on long-term debt. However, the greater debt premium on long-term debt cannot be economically removed through the swap market in the way the risk-free rate can be swapped. That is, the greater debt premium on longer-term debt continues to be borne by the firm.
- 6.3.29 Some suppliers have issued some debt with an original term to maturity that is longer than the regulatory period, for example, to manage refinancing risk. The Commission has surveyed regulated firms to see how many firms have a debt portfolio which, on average, exceeds the term of the regulatory period. Of the 29 regulated suppliers which responded to the Commission's request for information, the Commission estimates that only five (including Transpower, Vector and Powerco) have a debt portfolio whose weighted average tenor exceeds five years.
- 6.3.30 Where a supplier has a debt portfolio with a long average tenor, consumers benefit from the reduced refinancing risk and thus it is appropriate to recognise that part of the higher cost of issuing longer maturity debt cannot be removed through the swap market. Therefore, the cost of capital IM provides an allowance that recognises the incremental debt premium on longer term debt and the cost of executing an interest rate swap to shorten the re-pricing period of the long-term debt.
- 6.3.31 This allowance (called the term credit spread differential) will only apply where a supplier's debt portfolio has a weighted average tenor exceeding the length of the regulatory period. For suppliers whose debt portfolio has a weighted average tenor which is less than the length of the regulatory period, the allowance will not apply.

For such suppliers, a debt premium based on the term of the regulatory period is sufficient.²⁹³

- 6.3.32 This allowance will not be added to the estimate of the weighted average cost of capital (which will apply to all suppliers of services regulated under Part 4); rather the allowance will be added separately as an allowable cost (along with operating costs, depreciation etc) for qualifying suppliers only. The mechanics of how this allowance will apply in practice are explained in Appendix H6.
- 6.3.33 The practical effect of the term credit spread differential, in conjunction with a term for the risk-free rate and debt premium which matches the regulatory period, is to ensure suppliers are appropriately compensated including where greater debt premium is incurred due to the issue of long-term debt. It ensures suppliers are not overcompensated for risks and costs they do not incur (which would occur if the term of the risk-free rate and debt premium was greater than the term of the regulatory period).
- 6.3.34 The term credit spread differential is a practical way of recognising and compensating for the actual debt premium and swap costs incurred on long-term debt by some but not all suppliers, whilst ensuring the cost of capital is not overstated.
- 6.3.35 A more detailed discussion about the debt premium, including points raised in submissions and the Commission's response to these points, is included in Appendix H5. The term credit spread differential allowance is discussed in Appendix H6.

Debt issuance costs

- 6.3.36 Firms incur costs when raising new debt. These costs are not reflected in the debt premium but are an inherent cost of raising the debt finance needed to support an ongoing business. The Commission considers these costs should be included in the cost of capital for regulated suppliers.
- 6.3.37 Different forms of debt have different issuance costs. The Commission's estimate of the cost of issuing debt is based on the cost of issuing publicly-traded bonds, as this is the only publicly-available data.
- 6.3.38 The Draft Reasons Paper proposed an allowance of 0.30% per annum for a public issue of five year bonds, which was based on prior Commission decisions and a 1995 US estimate of debt issuance costs. Submissions from suppliers on the Draft Reasons Paper included more up-to-date data on the costs of issuing public bonds in New Zealand. Notwithstanding some issues with the quality of this data, the Commission considers this information does provide an improved basis for estimating the level of issue costs, and has increased the allowance for issue costs on publicly issued bonds to 0.35% per annum.

²⁹³ This could be seen as concessional for such suppliers since their actual debt tenor is less than the term of the regulatory period (and debt premiums rise with term). However, it is for each supplier to determine the average tenor of its debt portfolio. The Commission does not want to incentivise regulated suppliers to increase their refinancing risk by relying more heavily on shorter term debt.

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- 6.3.39 The Commission considers this is a generous allowance for the costs of raising debt funding, as many regulated suppliers make extensive use of bank loans which would generally have an all-up cost below the all-up cost of public bond issues (though bank debt may have more onerous covenants). It is also greater (as a percentage) than the levels allowed by overseas regulators but the Commission considers this is justified by the smaller relative debt issues by New Zealand's regulated suppliers which may result in issue costs being a larger percentage of the debt amount.
- 6.3.40 In 2010 the Commission undertook a confidential survey on aspects of regulated suppliers' debt portfolios. The results of this survey indicate that the average debt issuance cost for publicly traded bonds was 0.22% per annum. This implies the 0.35% per annum allowance for debt issuance costs in the IM is appropriate, if not generous in favour of suppliers.
- 6.3.41 Further detail on the level of debt issuance costs, including points raised in submissions and the Commission's response to these points, is included in Appendix H5. The appendix also includes a discussion on how regulated suppliers use swaps, and access offshore debt markets at a cost comparable with the all-up estimate of debt premium under the IM.

6.4 The Cost of Equity – The Choice of Model

- 6.4.1 The difficulties in estimating the cost of equity are greater than in estimating the cost of debt. The cost of equity, and most of its components, cannot be directly observed, but have to be estimated based on an analytical model. The choice of a model for determining the cost of equity is discussed in this section. Then the inputs for the preferred model have to be estimated. This is addressed in Section 6.5
- 6.4.2 The cost of equity is higher than the cost of debt as equity holders take more risk than debt holders (taking account of the different taxation treatments that may apply). There is a significant variation in risk between firms in different sectors of the economy. EDBs and Transpower, provide essential services with very stable demand, face limited substitutes and no, or limited, competition. Users have to use these services, they have very limited choices and very little bargaining power. More crucially, in regard to estimating the cost of equity, such firms may be less affected than the average firm by general cycles in economic activity. In that case, and run properly, such firms face significantly lower systematic risk than the average New Zealand firm. The expected return on equity in electricity lines businesses is much lower than for a typical or average company.
- 6.4.3 GPBs do have substitutes for their services and their services are not as essential to most users as electricity is. Accordingly the cost of equity for GPBs is likely to be more affected by market-wide factors than for EDBs and Transpower, but still below the market average.

The Capital Asset Pricing Model

- 6.4.4 There are a number of methods to estimate the cost of equity including the Capital Asset Pricing Model (CAPM), the dividend growth model and the Fama-French

three factor model. Of these, the CAPM is the most commonly used and most widely accepted methodology in investment analysis.

- 6.4.5 The use of the dividend growth model and the Fama-French three factor model to estimate the cost of equity is discussed in Appendix H2. These models have not gained the level of acceptance for estimating the cost of capital that the CAPM has. The Fama-French model is also criticised for its weak theoretical foundations, the possibility its results are due to chance; and the weak statistical significance of the factors included in the model. Its use in an Australian regulatory context was recently considered but firmly rejected by the AER.²⁹⁴
- 6.4.6 The dividend growth model is used by a number of US regulators but its use is best suited to listed firms as it requires a share price, good forecasts of dividend growth, and the method is only appropriate for stable, mature firms. Most New Zealand regulated firms are not listed, and there is a general lack of information required to reliably and confidently use the dividend growth model in a regulatory context.²⁹⁵
- 6.4.7 The CAPM was first developed in the early 1960s. The CAPM proposes that the cost of equity can be modelled as comprising a risk free component and a premium for risk. Under the CAPM, the size of the premium for risk increases in line with increases in the firm's exposure to systematic risk (with a measure of this risk which is referred to as beta). Systematic risk refers to market-wide risks which affect all risky investments. Non-systematic risk refers to risks which affect an individual company.
- 6.4.8 Globally, there is very widespread acceptance and use of the CAPM to estimate the cost of equity. In New Zealand, there is almost exclusive use of CAPM to estimate the cost of equity. The CAPM is:
- taught in undergraduate courses and texts;
 - used by advisors and analysts in the market in estimating the cost of capital for firms;
 - used in independent appraisal reports on takeovers; e.g. recent uses are Abano and NZ Farming Systems;
 - used by many companies in estimating their cost of capital for consulting on pricing or disclosing regulatory returns; and
 - used by The Treasury in estimating the Cost of Capital for Crown Entities and State-Owned Enterprises.
- 6.4.9 Other models to estimate the cost of equity have not achieved any significant degree of usage or acceptance in practice in New Zealand.

²⁹⁴ AER, *Jemena Gas Networks, Access arrangement proposal for the NSW gas markets Final decision*, 1 July 2010- 30 June 2015, pp.108-172. A summary of the AER's conclusions are set out in paragraph H2.26.

²⁹⁵ Use of the dividend growth model to estimate the cost of equity is further discussed in paragraphs H2.28 to H2.30.

- 6.4.10 While the theory underpinning the CAPM is seen as intuitive and appealing, like all economic models the CAPM has its limitations. Like any model it contains a number of simplifying assumptions that may not hold in practice such as that there are no restrictions on short-selling, markets are frictionless, and investors may borrow or lend unlimited amounts at the risk-free rate.²⁹⁶
- 6.4.11 Another criticism of the CAPM is its poor performance in empirical tests. The CAPM forecasts returns from a stock to increase in a linear relationship to increases in beta (i.e. systematic risk). In some *ex post* tests of the CAPM, returns show a flatter line than CAPM has projected. That is, returns do not reflect variations in beta as strongly as expected. Use of the CAPM may therefore understate the cost of equity for low beta stocks, and overstate the cost of equity for high beta stocks. Possible explanations for this are that CAPM may exclude some variables that may help to explain the actual returns shown by stocks. For example, studies have suggested a large number of potential explanatory variables including relative firm size, book to market values, and share price momentum.
- 6.4.12 There are, however, a range of possible explanations for the results from the empirical tests. For example, the results may reflect the serious methodological problems that exist in undertaking robust tests of the CAPM,²⁹⁷ or the difficulty of correctly observing the market portfolio.
- 6.4.13 Notwithstanding the criticisms of the CAPM, it is used extensively by regulators to estimate the cost of equity. The recent Independent Pricing and Regulatory Tribunal (IPART) review notes that all Australian regulators currently use the CAPM.²⁹⁸ Use of CAPM is required under the Australian National Electricity Rules (which have the force of law and govern the operation of the Australian National Electricity Market). The CAPM is also used extensively in regulatory decisions in Ireland, UK and other parts of Europe, and is sometimes used as a cross-check in the United States (where the dividend growth model is generally preferred).
- 6.4.14 The CAPM has been used by the Commission since Decision 207 (1988) to estimate the cost of equity under the Commerce Act. The use of the CAPM was considered and accepted by the New Zealand High Court in the Auckland Bulk Gas Users case. In its judgment in that case the High Court described the CAPM as “a sensible theory, logically rigorous and consistent with accepted and acceptable economic thinking”.²⁹⁹ The Court stated that the CAPM:

... is a simple concept, fundamental to financial theory, providing a positive relationship between the perceived or estimated risk and the required rate of return. We believe it is a satisfactory model and an appropriate method to calculate the capital cost for pricing purposes. We think that the Commission was entitled to make use of that methodology to the exclusion of other particular formulas in making its pricing decision.³⁰⁰

²⁹⁶ Copeland, T., Weston, J., and Shastri K., *Financial Theory and Corporate Policy* 4th Edition, Pearson Education, 2005, chapter 6.

²⁹⁷ See for example the discussion in paragraph H2.22.

²⁹⁸ IPART, *Alternative approaches to the determination of the cost of equity*, November 2009. IPART oversees regulation of the water, gas, electricity and public transport industries in New South Wales.

²⁹⁹ *Auckland Bulk Gas Users v Commerce Commission* [1990] 1 NZLR 448, p.467.

³⁰⁰ *Auckland Bulk Gas Users v Commerce Commission* [1990] 1 NZLR 448, p.467.

- 6.4.15 The Cost of Capital Expert Panel also considered how best to estimate the cost of equity. All members of the panel recommended the use of the CAPM (in one form or another).³⁰¹
- 6.4.16 The IM uses the CAPM for the following reasons:
- it enjoys almost universal use and acceptance by New Zealand companies, practitioners and analysts;
 - it has been used consistently by regulators in New Zealand, Australia, UK and Europe;
 - there is no consensus as to what model is better than the CAPM;
 - no other model enjoys even a fraction of the support in practice that the CAPM enjoys; and
 - there is still extensive ongoing debate about the theoretical basis of the other models, and there are difficulties in sourcing reliable data for these other models.

Simplified Brennan-Lally CAPM

- 6.4.17 The CAPM was developed by Sharpe, Lintner and Mossin during the early 1960s. The classical version of the CAPM assumes that all forms of investment income are equally taxed, and therefore that both dividends and capital gains are not taxed more favourably than interest. Since then a number of variations to the CAPM have been developed which incorporate different taxation considerations including the Officer CAPM in relation to the Australian taxation system and the Brennan-Lally CAPM in relation to the New Zealand taxation system. A different variant, the International CAPM, takes into account international investors.
- 6.4.18 The Brennan-Lally CAPM (Lally's adaptation for New Zealand circumstances of a CAPM model elaborated by Brennan) was developed to reflect New Zealand's taxation system. Specifically, it recognises the presence of imputation credits and the general absence of taxes on capital gains.³⁰² There is an extended form of the Brennan-Lally CAPM and a simplified version, but it is the simplified Brennan-Lally CAPM that has become the dominant form of the CAPM in use in New Zealand. Indeed, in New Zealand the term simplified Brennan-Lally CAPM has become largely synonymous with the generic term CAPM, and the terms are frequently used interchangeably. It is reasonably rare to find a CAPM-based estimate of the cost of equity in New Zealand that does not rely on the simplified Brennan-Lally CAPM.
- 6.4.19 In the New Zealand context, the simplified Brennan-Lally CAPM has generally been used by the Commission in prior cost of capital decisions. The reasons for

³⁰¹ Professor Myers recommended the classical CAPM, Associate Professor Lally recommended the simplified Brennan-Lally CAPM, while Professor Franks recommended the use of both of these models and the International CAPM.

³⁰² The dividend imputation system lets companies pass on to their shareholders credits for the New Zealand income tax paid by the company. This means that shareholders get the benefit of the income tax the company has paid.

preferring the simplified Brennan-Lally CAPM in the IM rather than other CAPMs are:

- the assumptions of the simplified Brennan-Lally CAPM are consistent with the New Zealand tax system, whereas the assumptions of other CAPMs are not. For example, the classical Sharpe-Lintner CAPM does not adjust for the effect of imputation credits and assumes the same rate of taxation on dividends as on capital gains. This is not representative of the New Zealand system of taxation. Professor Franks notes the UK used a similar model to the simplified Brennan-Lally CAPM when it had a tax imputation regime that was similar to New Zealand's;³⁰³
- the simplified Brennan-Lally CAPM is very widely used and accepted in New Zealand, including by companies, investment analysts, practitioners, independent takeover appraisal reports, and advisors, and is the preferred method for estimating the cost of capital in New Zealand;
- the continued use of the simplified Brennan-Lally CAPM was strongly supported at the Cost of Capital Workshop;³⁰⁴ and
- the continued use of the simplified Brennan-Lally CAPM was supported by most submissions on the Draft Reasons Paper, though submissions from suppliers often sought an allowance for model and parameter error.

Ad hoc allowance for model error

6.4.20 A number of submissions sought an *ad hoc* allowance for model error. In general, the argument was that an *ad hoc* adjustment should be made to the estimate of the cost of equity produced by the simplified Brennan-Lally CAPM to allow for the possibility that the cost of equity may be understated, especially on low beta stocks.

6.4.21 The fundamental difficulty with making *ad hoc* adjustments is that it is necessary to know why an adjustment is required, to assess whether it is justified (in the context of a particular industry, and to ensure consistency with the legislation) and what the size of the adjustment should be.

6.4.22 Associate Professor John Handley provided the following advice to the AER (on a similar issue):

Contrary to the view of the JIA/CEG, the fact that we don't have a clear explanation for the empirical results is of critical importance. In short, if there was a problem with the model (and again, the analysis of Roll suggests that this is not necessarily the case) then we would need to know exactly what that problem was before we could consider making any adjustments to the model's output. Further and as mentioned in my previous report, in this case, the most appropriate way to proceed would be to completely replace the Sharpe CAPM with an appropriate alternative asset pricing model. Simply making an *ad hoc* adjustment to the CAPM determined rate of return as suggested by CEG

³⁰³ Franks, J., Lally M., & Myers S, Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology, 2008, p. 11.

³⁰⁴ Commerce Commission, *Cost of Capital Workshop Transcript*, 12-13 November 2009, pp. 38-40. After the workshop, Vector noted that "[h]istorically the Commission has adopted the simplified Brennan-Lally CAPM. It was evident from the workshop that there was little dispute that this is an acceptable approach to use." Vector, *Cross Submission to Commerce Commission on the Weighted Average Cost of Capital Workshop*, 2 December 2009, p. 7.

(albeit to tie it back to their empirical results) would by definition be arbitrary and therefore could not be justified. Unless one knows first, whether there is a problem and second, what is the source of the problem then one cannot possibly come up with an appropriate “solution”.³⁰⁵

6.4.23 There are a number of other objections to making *ad hoc* adjustments:

- there are multiple competing models and explanations for the empirical results and no consensus on how these are to be interpreted. The Commission, therefore, cannot determine a robust or defensible basis for when an adjustment is required, how large it should be, and potentially in which direction it should go;
- there is no evidence that practitioners make explicit allowances for model error when estimating a firm’s cost of capital in non-regulatory contexts;
- there is no evidence before the Commission that regulated suppliers themselves, or their advisers, make any such *ad hoc* adjustment for model error when estimating the cost of equity in non-regulatory contexts;³⁰⁶
- the Commission has never made *ad hoc* allowances for model error previously and has not been made aware that any other regulators have done so; and
- some of the possible adjustments concern variables such as the relative size of firms, or a firm’s market value relative to its book value. These variables are firm-specific, whereas the IM seeks to estimate the efficient industry cost of capital.

6.4.24 The Commission does not consider it is appropriate to make *ad hoc* adjustments for model error, and the IM does not provide for any *ad hoc* adjustments for model error.

Specific submissions in support of an *ad hoc* allowance for model error

6.4.25 A number of submissions argued that the Commission was wrong to rely solely on the simplified Brennan-Lally CAPM. These submissions argued that an *ad hoc* allowance should be made to the cost of equity estimated using the simplified Brennan-Lally CAPM to allow for the possibility that it may understate the cost of equity on low beta stocks. For example:

- CRA, on behalf of Unison Networks, argued for a small company premium;³⁰⁷

³⁰⁵ Handley, J., Further Comments on the Sharpe CAPM, Report Prepared for the Australian Energy Regulator, 16 March 2009, p. 6.

³⁰⁶ Some firms may set higher hurdle rates of return for new investments that are above the estimated cost of capital. This may be done for a number of reasons, including to offset the risk that the forecast cash-flows from a new investment may reflect an over-optimistic view of its potential success. High hurdle rates for new projects are not, in the Commission’s view, evidence that an explicit allowance has been made for model error in using CAPM to estimate the cost of capital. Further, even if a firm sets higher hurdle rates for new projects, the expected return for the company is determined by its estimated WACC, not the hurdle rates.

³⁰⁷ Charles River Associates, *Regulated Returns for Australian and New Zealand Electricity Distribution*, 15 August 2010. A report on behalf of Unison, pp.5-14.

- Professor Grundy, on behalf of Vector, proposed the use of the Black CAPM,³⁰⁸ and
- a number of submissions noted that the assumption in the simplified Brennan-Lally CAPM that investors fully value imputation credits was not true in practice, so the estimates of cost of capital may be understated as a result.

6.4.26 Each of these suggestions is discussed in turn.

Small company premium

6.4.27 CRA, on behalf of Unison Networks, noted certain empirical studies that show that the actual returns on US companies with smaller market capitalisations may be greater than for companies with larger market capitalisations. This implies that use of the CAPM (which takes no account of company size) may understate the expected return for companies with small market capitalisations. CRA propose an additional premium to the cost of capital for regulated suppliers based on their relative size.

6.4.28 The Commission disagrees with this approach. First, it has not been conclusively established that smaller companies do have a higher cost of capital than implied by the CAPM because a number of studies have failed to find the so-called small cap effect. In recent advice to the Commission for Energy Regulation (Ireland) on the small company premium, Europe Economics observed that there is “scant evidence that there is any small companies premium to explain”,³⁰⁹ that “for the period since 1981, there appears to be no small companies premium”,³¹⁰ and “the use of a small companies premium is incompatible with the broad thrust of modern corporate finance theory”.³¹¹

6.4.29 Second, even if there is a small company premium it is not clear that this is relevant under Part 4 of the Act. As discussed in paragraphs 6.2.2 to 6.2.7, the focus on outcomes in workably competitive markets requires a focus on the efficient cost of capital, over time, for an industry. Firms which incur higher costs, by not increasing their market capitalisation, cannot expect to recover these costs from consumers in workably competitive markets. Accordingly, and consistent with the Part 4 Purpose, they should not expect to recover these costs in markets regulated under Part 4 either.

Black CAPM

6.4.30 Professor Grundy and CEG challenged the use of the simplified Brennan-Lally CAPM. After reviewing the weaknesses of the Sharpe-Lintner CAPM, Professor Grundy asserts that the Black CAPM better fits the empirical data, and that use of

³⁰⁸ Vector Limited, *Submission in response to the Commerce Commission’s Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital, Attachment: Grundy B. The Calculation of the Cost of Capital: a report prepared for Vector Limited*, 13 August 2010.

³⁰⁹ Europe Economics, *Report for the Commission for Energy Regulation, Cost of Capital for Transmission Asset Owner, Transmission System Owner, Distribution System Operator*, 11 June 2010, Appendix 1, p.3.

³¹⁰ Europe Economics, *Report for the Commission for Energy Regulation, Cost of Capital for Transmission Asset Owner, Transmission System Owner, Distribution System Operator*, 11 June 2010, Appendix 1, p.1.

³¹¹ Europe Economics, *Report for the Commission for Energy Regulation, Cost of Capital for Transmission Asset Owner, Transmission System Owner, Distribution System Operator*, 11 June 2010, Appendix 1, p.3.

the Black CAPM would produce much higher estimates of the cost of equity for low beta firms.

6.4.31 However, despite devoting 12 pages of his 18 page submission critiquing the Sharpe-Lintner CAPM, it is notable that Professor Grundy's submission:

- offers no evidence of the superiority of the Black CAPM, other than asserting that it better fits the data;
- contains no critique of the assumptions of the Black CAPM (despite Black himself calling one of the key assumptions in the Black CAPM “unrealistic”)³¹² nor does it address the criticisms of bias in a number of empirical tests of the CAPM that is made by Pettengill, Sundaram, & Mathur,³¹³
- does not refer to any empirical support for the Black model or note its mixed performance in empirical tests; and,
- perhaps most critically, does not discuss why, despite being developed 35 years ago, the Black CAPM still enjoys no popular support. The Commission is not aware of any advisor or company in New Zealand that uses the Black CAPM – which is similar to the conclusion the AER drew recently. Nor is there any evidence that Vector, on whose behalf Professor Grundy submitted, actually uses the Black CAPM itself. If the Black CAPM is a better predictor of the cost of equity (for New Zealand firms), it could be expected to be much more widely used than it is.

In the Commission's view, Professor Grundy's submission considerably overstates the level of support for the Black CAPM.

6.4.32 In short, there is no compelling evidence before the Commission that the Black CAPM is a better predictor of the cost of equity, such that the results of an established and generally used and accepted model (the simplified Brennan-Lally CAPM) should be replaced or adjusted with the results from a model that is not established, and that is not used in practice either by market participants or other regulators.

International investors and the value of imputation credits

6.4.33 A third line of submissions calling for an adjustment to the results from the simplified Brennan-Lally CAPM concerns its assumption, like that of the classical Sharpe-Lintner CAPM, of a segregated domestic market. That is, the simplified Brennan-Lally CAPM assumes all investors are resident shareholders and can use

³¹² Black, F., Capital market equilibrium with restricted borrowing, *Journal of Business*, 1972 (45) p.444, p. 446.

³¹³ G. Pettengill, S Sundaram, & I. Mathur, The Conditional Relation between Beta and Returns, *Journal of Financial and Quantitative Analysis*, Vol. 30, No, 1 Mar 1995, pp. 101-116. Pettengill et al argue that many prior empirical tests are biased against the CAPM as they fail to adjust for the conditional relationship between actual returns and beta. Adjusting for this bias, Pettengill et al find a strong positive relationship between beta and returns. Their work spawned a significant number of subsequent studies, the results of which were also more supportive of the CAPM than previous studies, and in particular that there was a strong relationship between beta and returns.

the imputation credits paid with dividends. A number of submitters noted that this assumption was unrealistic given the high level of international ownership in New Zealand generally. Submitters argued that this implied the simplified Brennan-Lally CAPM may therefore underestimate the cost of capital on the grounds that international investors would require a higher return than domestic investors since the international investors cannot use the imputation credits distributed by New Zealand companies.

- 6.4.34 The Commission considers that domestic and international investors have different perspectives on a number of components of the cost of capital, not just how imputation credits are valued. In particular, international investors hold different portfolios and perceive the relative risk of New Zealand investments differently to domestic investors. For international investors, the risk of New Zealand firms is measured against the range of investments they have access to. New Zealand firms may well represent a diversification opportunity from the perspective of such investors. In that case, investment in New Zealand firms would not add as much systematic risk and could in this sense be less risky than if evaluated only in the context of other New Zealand firms.³¹⁴
- 6.4.35 The simplified Brennan-Lally CAPM was designed to focus on New Zealand resident shareholders. To consider the position of international investors a different CAPM model is required, such as the International CAPM. The International CAPM takes into account that international investors hold a very different market portfolio to New Zealand investors, and may face a different market risk premium, beta and risk-free rate to New Zealand investors. It is far from clear that this will produce a higher estimate of the cost of equity. Indeed the available evidence suggests that it is more likely that use of an International CAPM will produce lower estimates of the cost of equity than a domestic CAPM would estimate.³¹⁵ That is, use of a domestic CAPM (such as the simplified Brennan-Lally CAPM) is therefore more likely to be generous in favour of New Zealand suppliers, than the use of an international variant of the CAPM. In previous advice to the Commission on electricity lines businesses, Dr Lally sought to quantify the potential bias from use of a domestic CAPM rather than an international variant.³¹⁶ He concluded that the cost of equity using a domestic CAPM (simplified Brennan-Lally CAPM) was about 0.7% higher than if an International CAPM was used.³¹⁷

³¹⁴ There is strong support for this conclusion in the literature. See, for example: Stulz, R., Globalization of equity markets and the cost of capital, Paper prepared for the SBF/NYSE Conference on Global Equity Markets, Feb 1999, Table 1. Perold, A., The Capital Asset Pricing Model, *The Journal of Economic Perspectives*, Vol. 18 No. 3, 2004, pp.3-24.

³¹⁵ See, for example, the argument of Dr Lally (in Lally, M., *The cost of capital for regulated entities, Report Prepared for the Queensland Competition Authority*, February 2004, pp.27-32) and in the Expert Panel report (Franks, J., Lally M., & Myers S, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, 2008), at p. 11. And see also, for example, Stulz, R., Globalization and the cost of capital: The Case of Nestle, *European Financial Management*, 1995, pp.30-38; Errunza, V., and Miller, D., Market segmentation and the cost of capital in International Equity Markets. *Journal of Financial and Quantitative Analysis*, Vol. 35, December 2000, pp.577-600; Errunza, V., and Miller, D., Market segmentation and the cost of capital in International Equity Markets. *Journal of Financial and Quantitative Analysis*, Vol. 35, December 2000, pp.577-600.

³¹⁶ Lally, M., *The Weighted Average Cost of Capital for Electricity Lines Businesses*, September 2005, pp.63-66.

³¹⁷ Lally, M., *The Weighted Average Cost of Capital for Electricity Lines Businesses*, September 2005, p.66. Assuming an asset beta of 0.50, and 40% leverage, the domestic CAPM increased the WACC by about 1% over the international CAPM.

Conclusion on choice of model for estimating the cost of equity

- 6.4.36 The Commission considers the simplified Brennan-Lally CAPM is the best model for estimating the cost of equity in New Zealand. Like other models it has its imperfections. However, the simplified Brennan-Lally CAPM enjoys such widespread support, and competing models such limited support, that there is currently no credible alternative.
- 6.4.37 The Commission acknowledges that the results of a number of empirical tests imply that the CAPM may understate the returns on low beta stocks. This possibility is acknowledged also by the Cost of Capital Expert Panel. However, there are a number of possible explanations for the results of the empirical tests, no better model is available, and there is no reliable basis for determining the size or direction of any adjustment for model error that may be required. Nor is there any evidence that New Zealand market participants make an allowance for model error when using the simplified Brennan-Lally CAPM to estimate the cost of equity for New Zealand firms. In short, the evidence is not sufficient to justify making a specific ad hoc adjustment to compensate for the possibility of model error.
- 6.4.38 To address a number of uncertainties over the true cost of capital, the IM requires the Commission to estimate a range for the cost of capital and to use an estimate of the cost of capital above the mid-point of this range when setting price-quality paths (this is discussed in paragraphs 6.7.3 to 6.7.12 below and in Appendix H11). Further, the Commission's estimate of the cost of capital using the IM is checked for reasonableness against a range of other information, and the Commission concludes that its estimates produced using the simplified Brennan-Lally CAPM are reasonable and commercially realistic. Appendix H13 discusses the reasonableness tests in detail.
- 6.4.39 The application of the simplified Brennan-Lally CAPM is discussed in the next section.

6.5 Cost of Equity – Applying the Simplified Brennan-Lally CAPM

- 6.5.1 Under the simplified Brennan-Lally CAPM, the expected cost of equity is a function of the risk-free rate (after tax) plus the equity beta multiplied by the Tax-adjusted Market Risk Premium (TAMRP).

$$\text{Cost of equity} = \text{Risk-free rate} \times (1 - \text{Investor tax rate}) + \text{Equity beta} \times \text{TAMRP}$$

- 6.5.2 The following section considers each component in turn.

The risk-free rate

- 6.5.3 The same term of the risk-free rate is adopted for the cost of equity that was used for the risk-free rate and the debt premium. This ensures consistency in estimating the cost of equity and the cost of debt. It also ensures the overall cost of capital is estimated on a basis consistent with the regulatory period to which it will be applied.

TAMRP

- 6.5.4 The market risk premium (MRP) represents the additional return, over and above the risk-free rate, that investors look for to compensate them for the risk of holding a

portfolio of average risk (more precisely the market portfolio which is the average risk portfolio).

- 6.5.5 Under the simplified Brennan-Lally CAPM, the MRP is adjusted for tax faced by the investor on equity returns (hence, tax adjusted MRP, or TAMRP). The TAMRP can be derived from the MRP. Consistent with the use of a five year term for the risk-free rate in the CAPM, the Commission also uses a five year risk-free rate when estimating the TAMRP.
- 6.5.6 The TAMRP is a forward looking concept which cannot be directly observed. A number of approaches can be used to estimate the TAMRP. These approaches include:
- studies of historic returns on shares relative to the risk-free rate;
 - surveys of investors that ask them to state their expected rate of return for the overall market; and
 - empirical estimates of the MRP from share prices and expected dividends.
- 6.5.7 In setting a value of the TAMRP, the Commission has considered a range of information sources. The most common approach to estimation of the TAMRP is to use historic returns on the market. While *ex post* returns have fluctuated significantly over time, regulators and practitioners have typically used or placed weight on estimates over long periods of time.³¹⁸
- 6.5.8 There is debate as to whether historical premiums are accurate predictors of future premiums. A number of prominent finance experts have argued that future rates of return will be less than that experienced historically.³¹⁹ Surveys of investors can provide an indication of the premium that investors will look for in the future. However, surveys can be unreliable as respondents can, for example, interpret questions in different ways.
- 6.5.9 The Commission has considered a range of information, including both forecast and historic estimates of the TAMRP. A range of such estimates is shown in the table below. The table evidences a wide range of estimates of the TAMRP. Both the mean and median are around 7%.

³¹⁸ Conceptually, over the long term, the occasions on which the premium of actual returns over the risk-free rate exceeds investors' expectations should be offset by the occasions on which that premium is below investors' expectations. So the average premium will therefore provide an estimate of the premium that on average investors look for.

³¹⁹ See for example Dimson, E., March P. and Staunton M., *Triumph of the Optimists: 1001 Years of Global Investment Returns*, Princeton University Press, New Jersey, 2002; Dimson, E., March P. and Staunton M., Global Evidence on the Equity Risk Premium, *Journal of Applied Corporate Finance*, Vol. 14, 2003, pp. 27-38; and Arnott, R. and Bernstein P., What Risk Premium is 'Normal'?, *Financial Analysts Journal*, Vol. 58, No. 2, March/April 2002, pp. 64-85.

Table 6.2 Estimates of the TAMRP - Assuming a 5-year term (where possible) of the risk-free rate for 2010

Methodology	NZ	US	Other	All
Ibbotson *	7.27%	7.67%	7.50%	
Siegel *	6.40%	7.30%	6.60%	
Cornell	5.20%	6.80%		
Survey	8.20%	6.90%		
Median	6.84%	7.10%	7.05%	7.09%
Mean	6.77%	7.17%	7.05%	6.98%
* The Ibbotson estimate for “Other” and Siegel estimates in this table are for a 10-year risk-free rate term not a 5-year term. It is not possible to adjust the Ibbotson estimate for “Other” due to the lack of a suitable proxy. It is not possible to adjust the results from the Siegel method due to the lack of a term structure for inflation-proof bonds.				

- 6.5.10 A number of submissions from suppliers called for a TAMRP of 7.5%. In support of this, submitters referred to an informal survey of attendees at the Cost of Capital Workshop where, at that time, most participants were using a TAMRP of 7.5% (responses ranged from 7% to 7.75% with one response of 9%).
- 6.5.11 The Commission does not consider this informal survey to be a good indicator of the TAMRP in New Zealand. In particular, the sample at the conference was very small, it was not randomly selected (most of the attendees were selected by regulated suppliers), and the attendees’ views are not representative of the range of views on the prevailing TAMRP in New Zealand. For example, the informal survey excludes all of the major investment banks who are major players in raising debt and equity finance for many firms. New Zealand investment banks use TAMRP estimates ranging between 6.5% and 7.25% as shown in Table 6.3 below.

Table 6.3 TAMRP Estimates Used By Major New Zealand Investment Banks

Investment bank	TAMRP estimate used
Deutsche Bank / Craigs Investment Partners	6.5% (plus separate recognition for imputation credits)
Goldman Sachs	6.8%
Forsyth Barr	7%
UBS	7%
Macquarie Bank	7%
First NZ Capital	7.25% (uplifted from a normal 7% after the GFC)

- 6.5.12 Many New Zealand advisors that propose a 7.5% estimate of the TAMRP appear to rely on research on the New Zealand TAMRP undertaken by PwC. In a submission on behalf of ENA, PwC critiques the Commission’s discussion of the TAMRP

estimate in the EDB Draft Reasons Paper, including that it relies on out-of-date information.³²⁰

- 6.5.13 PwC's publicly available research in support of its 7.5% estimate of the TAMRP is dated 2002. The Commission estimates that if this were updated for the subsequent performance of the New Zealand market, the estimate of the TAMRP would fall by approximately 0.5% to around 7%.³²¹
- 6.5.14 The appropriate level of the TAMRP was considered also by the Commission's Cost of Capital Expert Panel. The panel recommended that the Commission retain its approach of examining both forward-looking and backward looking estimates, though the experts differed on the weight that should be given to each. The panel considered the Commission's proposed 7% estimate of the TAMRP to be reasonable. The Commission has used an estimate of 7% since 2003.
- 6.5.15 In light of all the information available to it, the Commission considers the best estimate of the likely future long-term TAMRP for the NZ market is 7%. This is because it:
- best reflects the range of evidence available, including both historical returns and expected future returns;
 - is considered reasonable by the Cost of Capital Expert Panel; and
 - is consistent with the range of TAMRP estimates used by New Zealand market participants, including New Zealand investment banks.

Impact of the GFC

- 6.5.16 In the Draft Reasons Paper the Commission proposed a temporary uplift of 0.5% to 7.5% in the TAMRP until June 2011 to reflect the effects on the premium for risk from the Global Financial Crisis (GFC). The Commission took this view on the basis of advice from the Cost of Capital Expert Panel that the MRP had likely increased as a result of the GFC.³²² However, as there was no good information on the amount or duration of any increase, the size and timing of the uplift was a judgement call by the Commission. Some, but not all, regulators in other countries also temporarily increased their MRP estimates.
- 6.5.17 Some submissions argued that the Commission was premature to conclude the GFC would end by June 2011. The Commission accepts that the effects of the GFC in terms of slow economic growth may last beyond June 2011, but with respect to the TAMRP the relevant issue is the GFC's effect on the size of the premium investors seek for holding risky assets. There is strong evidence that the increase in the TAMRP from the GFC was temporary and is reverting to normal (that is, around 7%). In particular the Commission notes:

³²⁰ The Commission comments on other issues raised by PwC regarding the TAMRP are in Appendix H7.

³²¹ This is discussed at paragraph H7.73.

³²² J. Franks, M. Lally, & S. Myers, *Recommendations to the New Zealand Commerce Commission on whether or not it should change its previous estimate of the tax-adjusted market risk premium as a result of the recent global financial crisis*, 14 April 2010.

- the New Zealand share market and global share markets have stabilised and are at levels well above their GFC-induced lows;
- the VIX, a key short-term indicator of investor risk aversion, has fallen significantly and is back to around its long-term trend levels;³²³
- the Australian Competition and Consumer Commission, which increased its MRP estimates after the GFC, has in recent decisions reverted back to its normal long-run estimate of the Australian MRP;³²⁴
- annual surveys of the level of MRP companies and analysts use in their CAPM models indicate a decline since the GFC;³²⁵ and
- many New Zealand market participants did not increase their TAMRP estimates during or after the GFC (for example only one of the advisors at the Cost of Capital Workshop had increased its TAMRP estimate). Some New Zealand market participants have subsequently reduced the temporary increase they made to their TAMRP estimates during the GFC (e.g. First NZ Capital).

6.5.18 For the above reasons, the Commission concludes the best estimate of New Zealand's long-run TAMRP remains 7%, and that it is prudent and realistic to temporarily increase the estimated TAMRP to 7.5% but that this should end during 2011. The estimated TAMRP is expressed as a five-year composite rate. For the five-year period which commences on 1 July 2010, the TAMRP is 7.1% and for the five year period which commences on 1 July 2011 the TAMRP is 7%.

Asset betas

6.5.19 Beta is a measure of exposure to systematic risk. Systematic risk measures the extent to which the returns on a company fluctuate relative to the equity returns in the stock market as a whole. If an investment had no systematic risk (i.e. it would show no correlation with returns on the market), its equity beta would be zero.³²⁶ If an investment in the equity of a company is of average risk, the equity beta will be 1. This means that the premium over the risk-free rate that equity investors expect will be the same as the average for the overall market (the TAMRP).

6.5.20 Beta is estimated empirically. As the cost of capital is intended to be forward-looking, forward-looking betas are required. As there is no reliable way to forecast asset betas, the Commission, like other analysts, assumes that historic beta estimates are indicative of future betas. Historic estimates of average betas are used as beta is expected to be relatively stable over time.

³²³ VIX is the ticker symbol for the Chicago Board Options Exchange's Volatility Index. The VIX is a widely used measure of market expectations of near-term volatility conveyed by S&P 500 stock index option prices. Higher levels of the VIX indicate greater expected market volatility, while lower VIX levels indicate a more benign outlook.

³²⁴ See for example, ACCC, *Australian Postal Corporation 2010 Price Notification Decision*, May 2010, p. 80 and ACCC *Australian Rail Track Corporation Limited Hunter Valley Coal Network Access Undertaking*, Draft Decision March 2010, pp. 565-570.

³²⁵ See for example Fernandez, P, and del Campo, J., *Market Risk Premium used in 2010 by Analysts and Companies: a survey with 2,400 answers*, May 2010. In the survey reported in that paper three times as many respondents had reduced their MRP estimates in 2010 when compared to their estimates in 2009, than had increased their estimates (pp. 3-4, and 6-7).

³²⁶ The Commission is not aware of any company which has a beta of zero.

6.5.21 At the time of the Draft Reasons Paper the Commission estimated the asset beta of 0.34 for electricity businesses based on analysis of the monthly data over five years for 54 US, UK, Australian and NZ electricity and gas companies. Since then, the Commission has undertaken extensive further analysis of relevant asset betas. The Commission's analysis is set out in more detail in Appendix H8. The Commission's empirical analysis included:

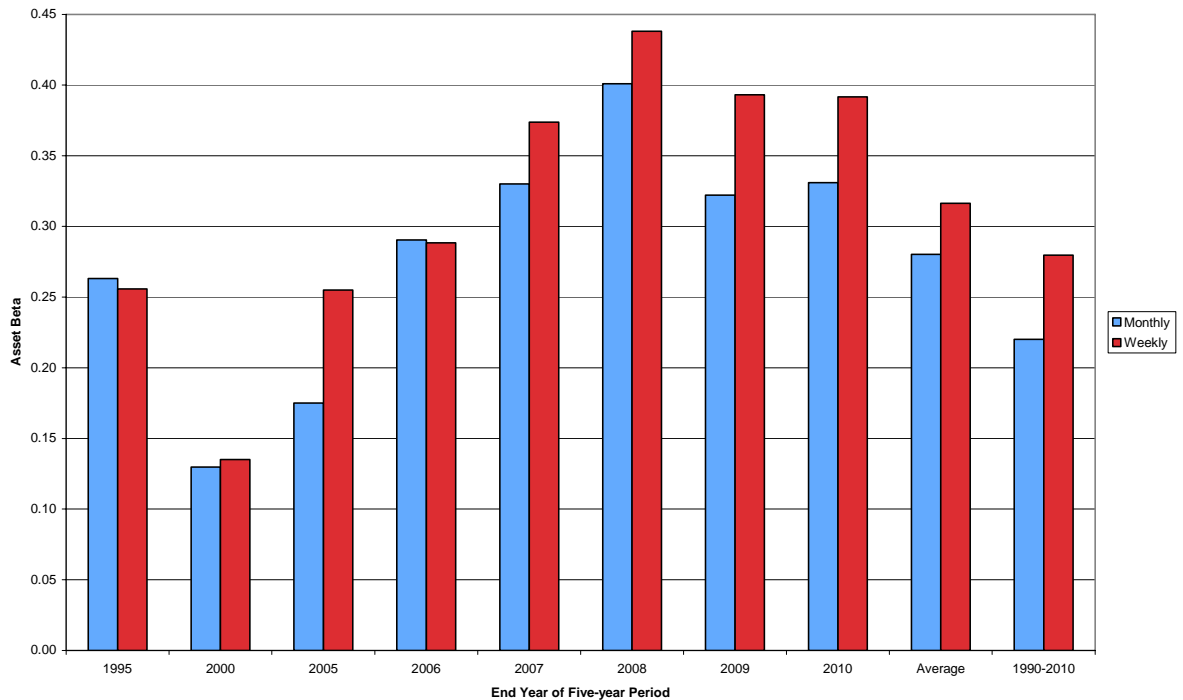
- a wide range of sampling periods, using data over the period from 1990 to 2010. This was to ensure the estimate of the asset beta was not due to a sampling period that was unrepresentative of the true beta. This assumes that the average beta for the industry is relatively stable;
- daily, weekly, and monthly frequency data. This was to ensure the estimate of the asset beta was not biased by the choice of sampling frequency,³²⁷ and
- a large sample of 79 US, UK, Australian and NZ electricity and gas companies. Small companies were excluded to ensure any thin trading in their shares could not affect the estimates of the asset beta.

6.5.22 A summary of the results is shown in Figure 6.3 below. The additional analysis produced an average asset beta of 0.28 using monthly data and 0.32 using weekly data.³²⁸ This confirms the Commission's original estimate of 0.34 included in the Draft Reasons Papers for EDBs, GPBs, and Transpower is a reasonable estimate of the asset beta. Indeed it indicates, based on the broader range of time periods that were analysed, that an allowance of 0.34 is generous in favour of suppliers, and that the asset beta estimate could be reduced to around 0.30. This would be in line with the Commission's estimates in previous decisions. However, given the variability in the estimates, and that beta cannot be estimated with precision, the Commission considered the more prudent approach was to leave the estimate of the asset beta at the level of 0.34 that was proposed in the Draft Reasons Paper.

³²⁷ The advantage of shorter (e.g. daily) periods is that they provide more observations, and potentially increase the statistical robustness of estimating beta. The disadvantage of shorter periods include that beta can be distorted if stocks trade infrequently. Shorter periods are also further removed from the concept that is being estimated (i.e. how stocks perform relative to significant market movements) and may therefore be misleading if share prices do not follow a purely random walk.

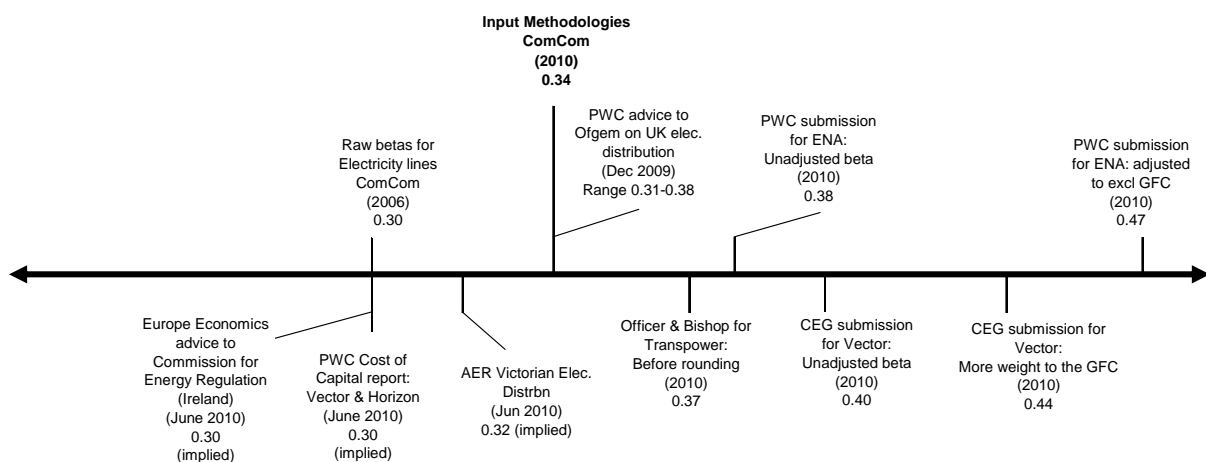
³²⁸ The beta estimates using daily data were very similar to those using weekly data.

Figure 6.3 Comparable Companies Unadjusted Asset Betas



6.5.23 To assess the reasonableness of the asset beta estimate, the Commission has compared the results of its asset beta analysis across a range of estimates of the asset beta from other sources. The results of this comparison are shown in Figure 6.4 below.

Figure 6.4 Comparison of Asset Beta Estimates for EDBs and Transpower with Other Asset Beta Estimates



6.5.24 Figure 6.4 shows that despite the differing approaches to estimating beta, and the different periods analysed, most estimates of the asset beta for electricity distribution and transmission companies fell within a reasonably tight range of between 0.30 and 0.40. A recent review by Europe Economics for the Commission for Energy

- Regulation (Ireland) noted that the range of asset betas in previous Irish and UK regulatory decisions on energy utilities was between 0.20 and 0.41.³²⁹ Figure 6.4 also shows that the Commission's 0.34 estimate of the asset beta for electricity distribution and transmission companies falls firmly within the range of comparable information, and indeed is near the middle of that range. This supports the Commission's view that its estimate is a reasonable estimate of the asset beta for EDBs and Transpower.
- 6.5.25 Some submissions asked the Commission to adjust its asset beta estimate in light of the effect of the GFC. PwC on behalf of ENA submitted that the Commission should exclude the period of the GFC when estimating the asset beta. PwC's analysis shows an increase in its estimate of the asset beta from 0.38 to 0.47 if the GFC period was excluded. The Commission notes, however, that in its advice to Ofgem on the cost of capital for the UK electricity distribution businesses (December 2009), PwC UK did not propose to exclude the period of the GFC when estimating the asset beta. Further, PwC did not exclude the period of the GFC when estimating the asset beta for airports in submissions to the Commission on the Airports Draft Reasons Paper.³³⁰
- 6.5.26 In stark contrast to PwC's submission to exclude the period of the GFC for EDBs, CEG on behalf of Vector submitted that the Commission should give greater weight to beta estimates during the GFC, as beta matters most to investors when risk is high. Taking this approach, CEG estimated an asset beta of 0.44 compared with CEG's unadjusted beta estimate of 0.40. In a subsequent submission on behalf of Vector, CEG submitted that the Commission should exclude the period of the "tech boom and wreck" period (circa 2000-2002) on the basis that it was unrepresentative.³³¹ The Commission cannot see on what principled basis one period of significant market volatility (the GFC) should be given greater weight, while another period (the dot com era) should be excluded as being 'unrepresentative'.
- 6.5.27 The Commission cannot reconcile the submissions from PwC and CEG as regards the appropriate treatment of the period of the GFC. The Commission does note that after PwC and CEG's adjustments, their resulting estimates of the asset beta are above the range of asset betas from the other sources noted in Figure 6.4 and above the range in previous UK and Irish regulatory decisions noted by Europe Economics.
- 6.5.28 The Commission's approach is to estimate beta over a range of periods, some of which include the GFC and those of which exclude it (i.e. accepting the fluctuations of the markets as they actually are), without taking a view on whether or not the effects of the GFC will continue or be repeated. Based on this analysis, the Commission set the asset beta for EDBs and Transpower at 0.34. While there is some evidence that asset betas showed some modest increases during the GFC, the asset betas were generally stable across the period.

³²⁹ Europe Economics, *Report for the Commission for Energy Regulation, Cost of Capital for Transmission Asset Owner, Transmission System Owner, Distribution System Operator*, 16 June 2010, p.93. The report also estimates the asset beta for a sample of European utilities, and concludes they range between 0.16 to 0.35 (p. 84).

³³⁰ PwC, *Analysis of airport asset betas, Letter to New Zealand Airports Association*, 3 August 2010.

³³¹ CEG, *Review of updated input methodologies, A report for Vector*, November 2010, p.47.

- 6.5.29 When estimating the asset beta for GPBs in prior decisions, the Commission has added 0.10 to the raw asset beta estimated from comparable companies. This increment was intended to reflect GPB's perceived greater exposure to systematic risk. While the Commission considers there are theoretical reasons to expect a higher beta for gas, at least in New Zealand (relating to growth options, operating leverage, the nature of the product and the composition of customers), this was not evident in the Commission's empirical analysis of overseas data. This analysis tends to show slightly lower asset betas for gas companies. Given the theoretical argument for higher gas asset betas for New Zealand GPBs, the Commission retains the 0.10 uplift for GPBs. While this could be seen as a concession in favour of GPBs, and notwithstanding the submissions which encourage the Commission to limit the use of ad hoc adjustments, the IM provides for the uplift to continue. While the Commission uses empirical methods wherever possible, the Commission's approach is not mechanical. Rather the Commission weighs the empirical results against other considerations, and exercises its judgement to best estimate the cost of capital and satisfy the Part 4 Purpose. Accordingly, in the Commission's judgement, 0.10 uplift in the asset beta will continue to apply for GPBs, resulting in an adjusted asset beta for GPBs of 0.44.
- 6.5.30 In a previous energy decision the Commission added an increment to the empirically-estimated raw asset beta to allow for the potential effect of different regulatory regimes on observed asset betas. For the reasons set out in detail in Appendix H8, the Commission considered such an increment is no longer appropriate. This was discussed also in the EDB and GPB Draft Reasons Papers³³² and the lack of submissions on this issue suggests submitters accept the Commission's reasons.
- 6.5.31 As the average asset beta for a regulated service is expected to be relatively stable, the asset beta of 0.34 for EDBs and Transpower and 0.44 for GPBs will not be updated during the life of the IM Determination.
- 6.5.32 A more detailed discussion about asset and equity betas, including detail on how the Commission has estimated the betas, the reasons why the IM does not include an allowance for regulatory differences, and a discussion of points raised in submissions, is included in Appendix H8.

Taxes

- 6.5.33 The corporate tax rates used in calculating the cost of capital mirror the statutory tax rates. These are 30% until the end of the 2011 tax year (typically 31 March 2011), and 28% from then on. The IM Determination allows for any future changes in tax rates to flow through to the calculation of the cost of capital.
- 6.5.34 The investor tax rate has been set to reflect the maximum prescribed investor rate under the Portfolio Investment Entities (PIE) regime. This rate applies to investors other than those investors on lower personal tax rates. Under the PIE regime taxes on profits in a PIE are capped at the maximum prescribed investor rate which is 30% until 30 September 2010, and 28% beyond that. Those rates are therefore used in determining the investor tax rate.

³³² At paragraphs 6.9.49 to 6.9.124.

6.5.35 Tax situations specific to particular investors do not in principle affect the cost of capital. Taxes are borne by the individuals themselves not by the firms of which they are shareholders. Therefore the IM does not provide for the tax circumstances of individual investors (accumulated tax losses, inability to use imputation credits). This is consistent with the requirement that the cost of capital under Part 4 must be consistent with outcomes in workably competitive markets. As discussed in paragraphs 6.2.2 - 6.2.7, the cost of capital in workably competitive markets is that of an efficient industry cost of capital. An estimate that was based on the tax situation of individual companies or investors would not reflect the cost of capital in a workably competitive market.

6.5.36 A more detailed discussion on taxation issues is included in Appendix H10.

6.6 Leverage

6.6.1 Leverage refers to the mix of debt and equity capital that is used to fund an investment. Leverage is used in two places in estimating the cost of capital. One use is to re-lever the asset beta into an equity beta (and vice versa). The second use is to derive a weighted average cost of capital (WACC) from the estimates of the cost of debt and the cost of equity.

6.6.2 In a tax neutral world, leverage is generally understood not to affect a firm's WACC, since the cost of capital reflects the riskiness of the cash flows, rather than how these are divided up between equity and debt investors. When corporate tax is considered, the WACC is generally understood to decline with increases in leverage.³³³ This is because interest costs are tax deductible to the firm but dividends are not.

6.6.3 When personal tax is considered some of the tax advantages of debt are reduced. The New Zealand dividend imputation credit regime allows firms to pass on to their shareholders a credit for the tax the company has already paid.

6.6.4 When the simplified Brennan-Lally CAPM is used to estimate the cost of equity (in conjunction with the simplified beta leveraging formula, i.e. debt beta is assumed to be zero), and the estimated cost of debt includes a positive debt premium, the resulting estimate of WACC increases as leverage increases.³³⁴ The higher the value for the debt premium incorporated in the estimated cost of debt, the greater the effect on the resulting estimate of WACC as leverage increases.³³⁵ This anomaly is being created by the analytical models used to estimate the WACC rather than simply reflecting unusual market conditions.

6.6.5 This positive relationship between leverage and the estimated cost of capital is a potentially serious anomaly as it is inconsistent with the behaviour of firms in workably competitive markets. That is, firms in workably competitive markets do issue debt and, so long as the debt levels are prudent, are considered to be acting

³³³ This is the context normally set out in textbooks when discussing the use of the classical CAPM to estimate the cost of equity, as an input to estimating the WACC.

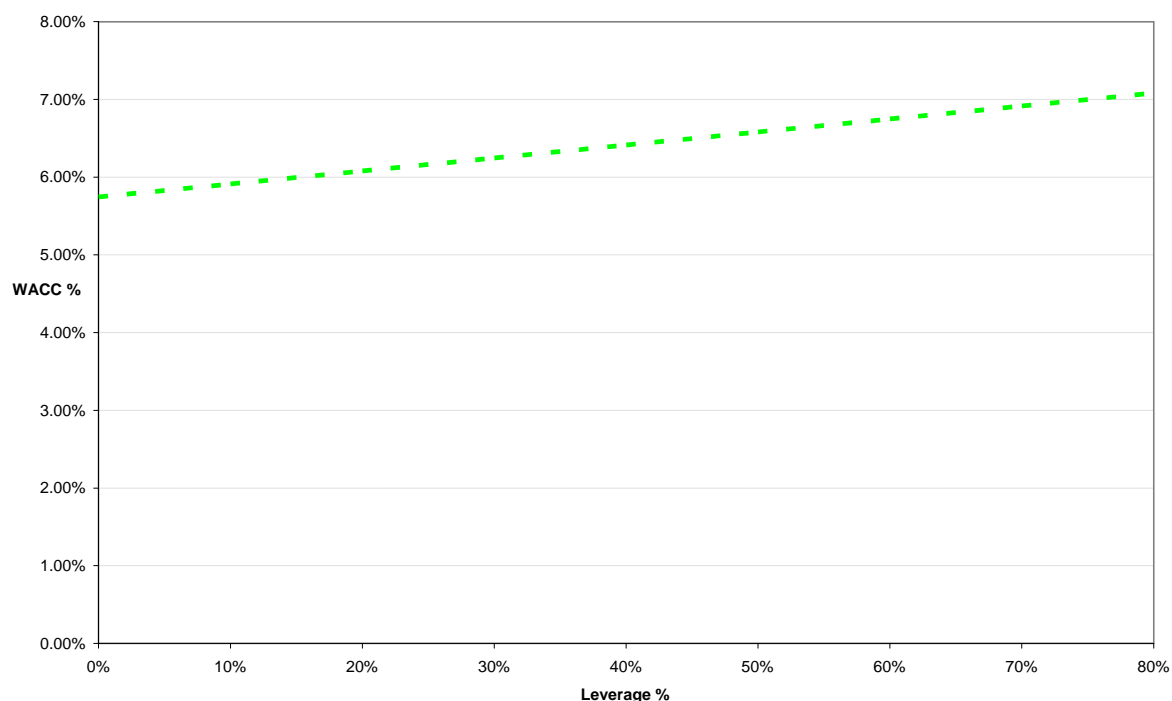
³³⁴ The debt premium itself is a function of leverage. That is, the debt premium would be expected to increase as leverage increases.

³³⁵ If the value for the debt premium incorporated in the estimated cost of debt is sufficiently high, the resulting estimate of WACC can increase as leverage increases, even if the cost of equity is estimated using the classical CAPM.

rationally when they do so. In regard to regulated suppliers this anomaly, if left uncorrected, would result in such suppliers obtaining an increase in the cost of capital if they were able to persuade the regulator to use higher leverage assumptions when applying the simplified Brennan-Lally CAPM. If the Commission were to regard the actual leverage of regulated suppliers as a relevant consideration in deciding on the leverage assumption, such suppliers would have an incentive to increase their leverage which could be detrimental to the long-term interests of consumers by raising the risk of bankruptcy.

6.6.6 The effect of leverage on the cost of capital can be substantial, as illustrated in Figure 6.5 below.

Figure 6.5 The Post-tax Cost of Capital Rises with Increases in Leverage under the Simplified Brennan-Lally CAPM³³⁶



6.6.7 The situation is not unique to the simplified Brennan-Lally CAPM. A similar anomaly was noted by the UK Competition Commission in its most recent price-setting review of Heathrow. The UK Competition Commission used the classical CAPM.

The key feature of these charts is the upward-sloping relationship that exists between a firm’s gearing and its pre-tax cost of capital when one assumes a zero debt beta. This suggests that gearing up increases a firm’s pre-tax cost of capital and therefore warrants the inclusion of a higher rate of return in price caps—something that can be seen explicitly in Table 1 at the beginning of this appendix where BAA’s estimates for the pre-tax cost of capital at Heathrow increase with the use of a higher gearing figure, while estimates of the pre-tax cost of capital at Gatwick fall on the assumption of lower gearing.

³³⁶ Assuming a risk-free rate of 4.64%, an all-up debt premium of 2.35% (including debt issuance costs of 0.35%), an asset beta of 0.34, a TAMRP of 7.1%, average investor tax rate of 28.2% and average corporate tax rate of 28.4%. These parameter values are consistent with the reasonableness tests the Commission has undertaken, see Appendix H13.

We find this overall position difficult to reconcile with the observed behaviour of a range of firms in a broad sample of different industries. In the regulated sectors, the trend in recent years has been for firms to inject more debt into their capital structures on the apparent assumption that higher levels of gearing represent more efficient financing. Indeed, ADI has told us that its own decision to move BAA's gearing from around 34 per cent to more than double this figure would improve the efficiency of BAA's financing.

Given this starting point, we do not accept the argument that higher levels of gearing produce a higher cost of capital. We do not believe that this is a credible characterization of the returns that investors require at different levels of gearing³³⁷

6.6.8 The Commission too would not want to set a higher cost of capital due to higher levels of gearing. To address this anomaly, the UK Competition Commission used debt betas.³³⁸ The Draft Reasons Papers proposed to resolve this anomaly by setting a single notional level of leverage of 40% to apply to all services regulated under Part 4.

6.6.9 In adopting the 40% notional leverage assumption in the Draft Reasons Papers the Commission addressed the anomaly in the simplified Brennan-Lally CAPM which sees the cost of capital increasing with leverage. The Commission sought to protect consumers from the risks of suppliers increasing leverage (which would result in a higher cost of capital if actual leverage was provided for in the IM), as higher leverage increases the risk of financial distress, and this has potentially detrimental consequences for consumers.

6.6.10 PwC (for ENA and Telecom) submitted that there are other more technically correct ways to address the anomaly of the cost of capital increasing with leverage. The two options identified by PwC were to use the leverage level observed in the samples of comparator companies (that is, 17% for airports and 44% for EDBs, GPBs and Transpower) or to use non-zero debt betas. PwC submitted that the:

“Commission is technically wrong to attempt to apply a single fixed leverage assumption to all regulated firms. If debt betas are to be excluded from the WACC analysis (which we concur with), then to be consistent the notional leverage used in the WACC estimation should be close to the average leverage of the comparator companies used to derive the (average) beta estimate. This is a fundamental requirement in order to be able to justify application of a “short cut” approach and thus ignore debt betas.”³³⁹

6.6.11 The use of non-zero debt betas is theoretically sounder than using notional leverage as the use of non-zero debt betas would reduce or eliminate the extent to which the post-tax WACC estimate for each service varies with leverage.

³³⁷ UK Competition Commission, *A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd)*, Appendix F - Cost of Capital, 28 September 2007, paragraphs 88-90, p. F23.

³³⁸ A debt beta measures the systematic risk associated with a firm's debt. A detailed discussion on debt betas is included in Appendix H9.

³³⁹ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, p. 8; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, p. 10.

- 6.6.12 However, the Commission notes that most submissions continue to prefer the use of zero debt betas, that most regulators do not use debt betas (though a minority do)³⁴⁰, and that the Commission has not used non-zero debt betas in the past. Further, there are practical difficulties in accurately estimating debt betas (but this is offset in part by the estimates available from regulatory decisions overseas, which are generally in the range of 0.1 to 0.2).
- 6.6.13 If the cost of capital IM specifies leverage for each regulated service in line with that observed for the respective sample of comparator companies (that is, 44% for EDBs, GPBs and Transpower), the cost of capital estimated and applied under Part 4 will be the same for those services, regardless of whether the debt beta is set at zero or at a level to make the estimated cost of capital invariant to leverage.
- 6.6.14 For these reasons, which are explained more fully in Appendix H3, the IM specifies leverage of 44% for EDBs, GPBs and Transpower, and does not incorporate the use of non-zero debt betas (since for these leverage levels the resulting WACC is the same for all values of debt beta).
- 6.6.15 Some submissions proposed that regulated suppliers' actual leverage should be used. For the reason outlined in paragraph 6.6.5 this is not appropriate. If actual leverage were used, non-zero debt betas would have to be used in the simplified Brennan-Lally CAPM to minimise the effect of leverage on the estimate of the cost of capital and ensure there are no incentives on suppliers to increase leverage (or propose increases in leverage that would exploit the anomaly in the model).
- 6.6.16 As the equity beta is calculated using leverage and an asset beta, a leverage of 44% applied to an asset beta for EDBs (and Transpower) of 0.34 and for GPBs of 0.44 results in an equity beta for EDBs (and Transpower) of 0.61 and for GPBs of 0.79. The asset beta, leverage and resulting equity beta will be fixed for the duration of the IM Determination.

6.7 Estimating a WACC Range

- 6.7.1 The weighted average cost of capital reflects the cost of debt and the cost of equity, given the mix of debt and equity. There is a post-tax WACC and a vanilla WACC. The former includes the after-tax cost of debt; the latter includes the cost of debt before tax, as shown in the following equations.

$$\text{Post-tax WACC} = \text{Cost of debt (after tax)} \times \text{Leverage} + \text{Cost of equity} \times (1 - \text{Leverage})$$

$$\text{Vanilla WACC} = \text{Cost of debt} \times \text{Leverage} + \text{Cost of equity} \times (1 - \text{Leverage})$$

- 6.7.2 Post-tax WACC estimates are more frequently used in New Zealand, and more easily understood by interested persons, than vanilla WACC estimates. However, the use of vanilla WACC estimates is consistent with the IM's approach to regulatory tax for DPPs and CPPs. Accordingly, vanilla WACC estimates will be

³⁴⁰ Notably, the Queensland Competition Authority (see, for example, Queensland Competition Authority, *Gladstone Area Water Board: Investigation of Pricing Practices, Final Decision*, June 2010), pp.126-127. And see also the UK Competition Commission (UK), *A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd), Appendix F - Cost of Capital*, paragraphs 88-90, 28 September 2007, pp. F21-F28.

applied when setting DPPs, CPPs, and IPPs, while both vanilla WACCs and post-tax WACCs will be estimated for the purposes of information disclosure regulation.

Estimating a WACC range

- 6.7.3 The WACC must be estimated since its components, for example, the cost of equity, cannot be observed directly. This raises the prospect of error since it is not possible to know the true cost of equity. To allow for this estimation error, it is usual practice to estimate a range for the WACC.
- 6.7.4 The Commission has previously used estimates of the standard errors of the components of the WACC, to estimate a standard error of the WACC. This can be used to estimate the distribution of the estimate of the WACC, for example, the 25th and 75th percentile estimate. This approach is consistent with the Commission's previous practice.
- 6.7.5 A wide variety of submissions were made on the approach to estimating a range. Some submissions called for the use of Monte Carlo simulations, others for the Commission to use its judgement to chose a point estimate of the WACC from a range of WACC estimates that reflected ranges for certain parameters. Some submissions criticised the Commission's approach as implying greater precision than was possible in practice. Other submissions took the Commission's approach and called for different values for particular parameter estimates and the addition of more variables to the analysis. In short, there was no consensus on what a better methodology of establishing a range would be. The Cost of Capital Expert Panel generally supported the Commission's statistical approach.
- 6.7.6 It is a matter of judgement as to which approach is best. The IM specifies the statistical approach since it provides greater transparency and predictability for suppliers and interested persons. This promotes certainty for suppliers and consumers in relation to regulatory rules, requirements and processes.

The estimated cost of capital for regulated suppliers

- 6.7.7 The parameters for estimating the cost of capital for EDBs, GPBs and electricity transmission are set out in Table 6.4 below. The values for leverage, debt issuance costs, the equity beta, and the TAMRP will be fixed by the Determination. Tax rates are linked to certain statutes and update as these change. The parameters for the risk-free rate and debt premium change over time. Using the estimates observed during the month of August 2010, these are estimated to be 4.64% and 2.0% respectively.

Table 6.4 Parameter Point Estimates and their Standard Error

Parameter	Point estimate	Standard error
Leverage	44%	0
Debt issuance costs	0.35%	0
Asset beta (EDB / Transpower)	0.34	0.13
Asset beta (GPB)	0.44	0.14
Tax-adjusted market risk premium*	7.1%	0.015
Average Corporate tax rate	28.4%	0
Average Investor tax rate	28.2%	
Risk-free rate (as at 1 Sept 2010)	4.64%	0
Debt premium (as at 1 Sept 2010)	2.00%	0.0015 (minimum)

* Includes a 0.5% uplift to TAMRP for one year.

6.7.8 This results in the estimates of WACC as set out below in Table 6.5 as at 1 September 2010.

Table 6.5 Estimated WACCs using the Parameters Specified in Table 6.4

Estimate of WACC	Transpower & EDBs	GPB
Vanilla WACC	7.37%	8.08%
Post-tax WACC	6.49%	7.21%

Selecting a WACC range

6.7.9 As well as being estimated for the purposes of information disclosure, WACC will be an input into the setting of default and customised price-quality paths for EDBs and GPBs and for the IPP for Transpower. An error in estimating the WACC could therefore result in a WACC that is above or below the true (but unobservable) cost of capital. Prices may therefore be incorrectly set, relative to the actual costs of providing regulated services. This may affect incentives to invest, and the ability to assess if excessive profits are being earned.

6.7.10 In balancing the risk between setting the WACC too high or too low, the Commission assessed the consequences of possible errors. The consequences depend on the regulatory context in which the estimate of the cost of capital is being used. In some regulatory contexts a cost of capital estimate below the midpoint might be considered, in other contexts the midpoint is appropriate, in other contexts a cost of capital estimate that is above the midpoint would be appropriate.

6.7.11 The Commission's choice over the precise percentile estimate of the WACC that is used for price-quality regulation is informed by a number of considerations such as:

- the Part 4 Purpose is to promote the long-term benefit of consumers, including:

- ensuring suppliers of regulated services have incentives to invest and innovate (s.52A(1)(a)) and the potential long-term benefits to consumers from investment and innovation;
 - ensuring regulated suppliers are limited in their ability to extract excessive profits (s.52A(1)(d));
 - the risk that the true (but unobservable) WACC is above the estimated mid-point WACC;
 - the risk that CAPM and the simplified Brennan-Lally CAPM may underestimate the returns on low beta stocks;
 - the risk that the simplified Brennan-Lally CAPM may lead to higher estimates of the cost of capital than the International CAPM would for international investors, and that international investors are likely to be the marginal investors in the New Zealand markets; and
 - the risk of error in estimating individual parameters of the simplified Brennan-Lally CAPM including the asset beta and the TAMRP.
- 6.7.12 Incentives for dynamic efficiency can have significant benefits for consumers over the long term, so it is important to preserve incentives to invest and innovate. Accordingly, this consideration has been given greater weight than limiting suppliers' ability to extract excessive profits. Weighing the arguments, and having regard to the Part 4 Purpose, and in particular, that there are incentives for EDBs, GPBs, and Transpower to invest and innovate, the Commission adopts the 75th percentile estimate of the cost of capital as the cost of capital for price-quality regulation.
- 6.7.13 The various cost of capital parameter values and estimates are used to determine a post-tax WACC estimate using the methodology set out in the IM Determination. The resulting WACC estimate is then compared against a range of other information to ensure it is commercially realistic. This assists in determining whether the process for estimating the WACC specified in the IM is reasonable.
- 6.7.14 Based on the parameter estimates in Table 6.4, Table 6.6 shows the resulting point estimates for the WACCs for EDBs, GPBs and Transpower.

Table 6.6 Estimated WACCs (as at Sept 2010)

Parameter	Transpower & EDBs	GPB
Vanilla WACC	7.37%	8.08%
Post-tax WACC	6.49%	7.21%
Vanilla WACC (75th percentile)	8.09%	8.90%
Post-tax WACC (75th percentile)	7.22%	8.03%

- 6.7.15 On its website the Commission will publish annually for EDBs, GPBs, and Transpower:
- a mid-point estimate of the five year post-tax WACC for the purposes of ID regulation; and
 - an estimate of five year vanilla WACC at the 75th percentile to apply in setting price paths under DPP and CPP regulation (and for Transpower under IPP).
- 6.7.16 Three and four year equivalent estimates of vanilla WACC at the 75th percentile will also be published as required by CPP regulation, and estimated WACC ranges for the 25th to the 75th percentiles for both post-tax and vanilla WACC will be published to inform interested persons.
- 6.7.17 Further discussion on the WACC range is included in Appendix H11.

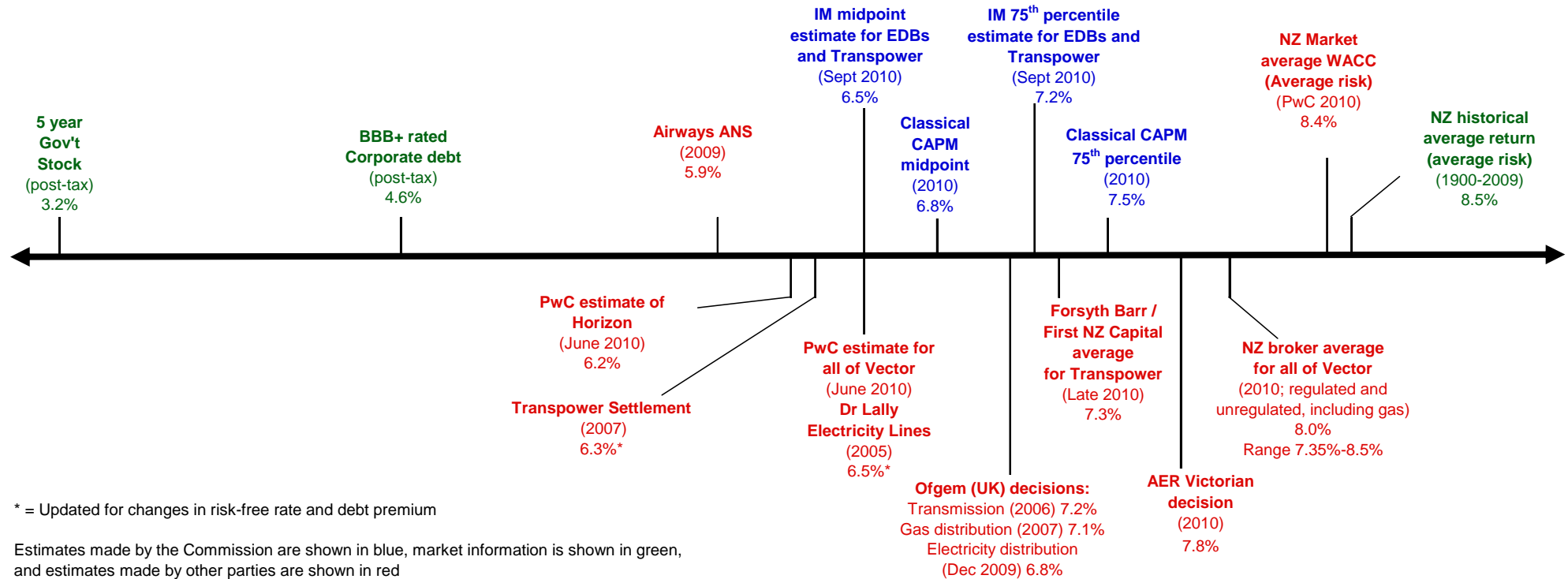
6.8 Does the Commission's Methodology Produce Commercially Realistic Estimates of the Cost of Capital?

- 6.8.1 The electricity line businesses are quintessential low risk businesses. They provide essential services, with very stable demand, face no real substitutes and no or limited competition. As providers of essential services, used 24 hours a day 365 days a year by virtually every consumer and business in the country, they have locked in users with no choices and little bargaining power. Such firms face significantly lower systematic risk than the average firm in the economy. Given their low systematic risk, equity investors in such companies would expect to earn a lower return on their investments, than in a more average company.
- 6.8.2 Figure 6.6 below compares the estimates of the post-tax WACCs for EDBs and Transpower against a range of other information. The reasonableness of the estimates for GPBs is discussed later, at paragraph 6.8.11. In particular:
- current New Zealand post-tax risk-free rates and post-tax cost of corporate debt;
 - historic and forecast estimates of the returns achieved by New Zealand investors on an investment of average risk;
 - previous New Zealand regulatory decisions, and recent regulatory decisions in the UK and Australia;
 - external estimates of the post-tax WACC for similar businesses, including estimates from PwC and New Zealand investment banks; and
 - an estimate of the cost of capital using the classical CAPM, as recommended by Professor Myers.

-
- 6.8.3 The current risk-free rate, corporate cost of debt, and the historic return on the New Zealand market can be estimated independently of the choice of model, CAPM or otherwise.
- 6.8.4 More detail on each of the data points in Figure 6.6 is included in Appendix H13.
- 6.8.5 As the 75th percentile estimate of the WACC will be applied under DPP and CPPs, the analysis focuses on that estimate made consistently with the IM. Further, as most comparative information is published on a post-tax basis, the analysis below uses the 75th percentile estimate of the post-tax WACC, as set out under the cost of capital IM.
- 6.8.6 The Commission's estimates of the post-tax WACC for EDBs and Transpower for application in setting price paths is reasonable since:
- it falls appropriately between the post-tax cost of debt and the cost of capital for the average New Zealand firm (based on historic and forecast estimates, and assuming 30% gearing). This is reasonable because:
 - EDBs and Transpower have much lower exposure to risk than the average New Zealand firm. Accordingly, the cost of capital for these regulated suppliers can be expected to be well below the cost of capital for a New Zealand firm of average risk; and
 - the cost of capital for an EDB or Transpower must be well above the cost of debt as the cost of capital includes the cost of equity (which is greater than the cost of debt);
 - the Commission's estimates for EDBs and Transpower are very close to Ofgem's estimates of the cost of capital for the corresponding regulated firms in the UK;
 - the Commission's estimates for EDBs and Transpower are above the cost of capital estimated by the self-regulating Air Navigation Service (part of Airways Corporation NZ), and similar (though generally above) the estimates implied in previous Commerce Commission decisions;
 - the Commission's estimate is close to two recent independent estimates of the post-tax WACC for Transpower; and
 - the Commission's estimates are above those estimated in PwC's most recent quarterly cost of capital report for Vector and Horizon.³⁴¹

³⁴¹ PricewaterhouseCoopers publishes estimates for around 70 listed New Zealand companies on a quarterly basis and is publicly available on the internet at <http://www.pwc.com/nz/en/cost-of-capital>. The June 2010 report is the most recent available at the time this Paper was finalised.

Figure 6.6 Testing the Reasonableness of the IM Estimates of the WACC Against Comparative Information



- 6.8.7 The Commission's estimates are below those set in recent Australian decisions. The Commission has examined closely the differences between the AER's most recent estimate for Australian electricity distribution businesses and the estimate using the IM.³⁴² The differences in WACC estimates are due to differences in current monetary conditions and taxation laws (neither of which are determined by the regulator), and the choice over the term of the risk-free rate and debt premium which matches the regulatory period (rather than a 10 year term preferred by the AER). However, the AER acknowledges that a 10 year term over-compensates suppliers.³⁴³ Also, the term credit spread allowance in the IM is not part of the WACC but it does compensate suppliers for the greater costs of issuing long-maturity debt.
- 6.8.8 For application in DPPs/CPPs, the IM uses the 75th percentile estimate of the WACC to ensure there are sufficient incentives to invest in regulated services for the long-term benefit of consumers. To achieve a similar objective, the AER uses a higher estimate of the equity beta than implied by its empirical estimate.³⁴⁴ In terms of its impact on WACC, the approach used in the IM appears more generous than the AER's approach in this regard.³⁴⁵
- 6.8.9 The Commission's estimates for Transpower's and EDBs' cost of capital is also below the average cost of capital estimated for Vector in recent broker reports. This is reasonable and to be expected since:
- the broker estimates are for all of Vector including its telecommunications, gas wholesaling, and metering businesses as well as the regulated services. The unregulated services would be expected to have a higher cost of capital; and
 - the broker estimates seek to estimate Vector's cost of capital over the life of its assets, and often use a 10 year risk-free rate which is higher than the current market average. On the other hand, the Commission's IM is specified for a five year regulatory period, and is explicitly linked to market interest rates.
- 6.8.10 Overall, the Commission considers this comparative information is consistent with its estimates. Therefore it strongly supports the Commission's conclusion that the cost of capital IM produces estimates of the cost of capital that are reasonable and commercially realistic. The use of commercially realistic estimates of the cost of capital under Part 4 regulation is important for ensuring that suppliers have incentives to invest and are limited in their ability to extract excessive profits.
- 6.8.11 The estimate of the WACC for GPBs under the IM is higher than for EDBs, reflecting the higher asset beta (systematic risk) the Commission considers GPBs face. There is limited comparative information on the WACC for New Zealand GPBs to test the IM estimates. Overseas regulators typically assume a similar WACC for electricity and gas pipeline services. This implies the New Zealand regime is favourable to New Zealand GPBs, but the Commission considers this is

³⁴² A more detailed discussion of the AER's decision is included from paragraph H13.32 of Appendix H13.

³⁴³ AER, *Electricity Transmission and distribution network service providers, Review of the weighted average cost of capital (WACC) parameters*, Final decision, May 2009, p.xviii and p.154.

³⁴⁴ AER, *Electricity Transmission and distribution network service providers, Review of the weighted average cost of capital (WACC) parameters*, Final decision, May 2009, pp.343-344.

³⁴⁵ See paragraphs H13.44 to H13.45.

appropriate given New Zealand GPBs likely face greater exposure to systematic risks than EDBs and Transpower.

Other potential reasonableness checks

6.8.12 Professor Myers and Professor Franks recommended the use of the Fama-French three-factor and the DCF model as reasonableness checks on CAPM estimates, “provided that necessary data are available and that the model’s assumptions are reasonably satisfied” (p. 8). However, there is very little New Zealand data available to robustly estimate a cost of equity using these methods and no submission provided estimates of the cost of equity in New Zealand using these models. Therefore, the Commission does not consider that it is practical to use these models as reasonableness checks.

Information on reasonableness tests in submissions

6.8.13 Some submissions included a discussion of reasonableness and comparative information on the cost of capital. These are discussed in Appendix H13 from paragraphs H13.75 - H13.106. The Commission has considered these submissions but, for the reasons set out in Appendix H, the Commission does not consider that they provide reliable tests as to whether the IM estimates of WACC are reasonable.

Assessing the reasonableness of the WACC in its regulatory context

- 6.8.14 The reasonableness of the cost of capital IM cannot be considered in isolation from the regulatory context in which it is to be used. Two examples of the importance of considering the WACC in its broader regulatory context are discussed below.
- 6.8.15 For many suppliers that are subject to price-quality regulation, prices will be determined by a DPP, which may involve a starting price adjustment. However, it is not proposed that the cost of capital IM will directly and mechanistically set the prices under the DPP / starting price adjustment. While the starting price adjustments have yet to be decided, the Commission has, in its discussion paper, proposed that the WACC would be used in conjunction with an ROI band, and that the 75th percentile estimate of the vanilla WACC would form the mid-point of the band.³⁴⁶ It is proposed that upwards and downwards adjustments to prices would only occur where the supplier’s ROI falls outside of the ROI band, and the adjustment would only bring them to the band limit rather than the midpoint. The proposed ROI band, and its impact on prices, has been interpreted by some commentators as an increase in the effective regulatory WACC by the width of the band.³⁴⁷ Consultation on the approach for starting price adjustments continues.
- 6.8.16 Second, the CPP regime enables regulated suppliers to choose when and whether to apply for a CPP, and to propose whether it should have a term of three, four or five years. A supplier choosing its own regulatory period is uncommon as in overseas jurisdictions suppliers cannot generally do this. The Commission will publish its estimate of the WACC that will apply for any CPP application, before the EDB or GPB applies for a CPP. Therefore when an EDB or GPB chooses to apply for a CPP, it will do so in full knowledge of what WACC would be used in setting the

³⁴⁶ Commerce Commission, *Starting Price Adjustments for Default Price-Quality Paths Discussion Paper*, August 2010.

³⁴⁷ Goldman Sachs, *A regulatory win. ComCom seeking a Benign Outcome?*, 6 August 2010. The percentage increases refer to the Commission’s worked examples in its discussion paper. See: Commerce Commission, *Starting Price Adjustments for Default Price-Quality Paths Discussion Paper*, August 2010.

CPP, and whether it implies an increase or decrease in prices. In short, these features of the CPP regime provide an opportunity for a regulated supplier to obtain a higher WACC (if interest rates and debt premiums have increased since DPP prices were last set), but without any commensurate risk of receiving a lower WACC.

- 6.8.17 The consideration of the cost of capital IM within the regulatory contexts in which it will be used further supports the reasonableness of the cost of capital IM. In summary, the way the DPP and CPP are determined in practice, provides a further buffer against the risks and consequences of a too low WACC being applied, and adversely impacting incentives to invest and innovate for the long term benefit of consumers.

CHAPTER 7: PRICING METHODOLOGIES

7.1 Introduction

7.1.1 Section 52T(1)(b) of the Act (as amended by the Electricity Industry Act 2010) requires that the IMs relating to particular goods or services must include, to the extent applicable to the type of regulation under consideration, an IM for pricing methodologies, except where another industry regulator (such as the Electricity Authority) has the power to set pricing methodologies in relation to particular goods or services.³⁴⁸

7.1.2 Given the responsibilities that the Electricity Authority has in respect of pricing methodologies for EDBs, and to ensure no overlap of the Commission's role with the Authority, the Commission has decided to set an IM for pricing methodologies for GPBs, but not for EDBs (see Chapter 2). This chapter sets out the Commission's key considerations in determining the IM for pricing methodologies and the application of the IM to gas pipeline services under each regulatory instrument.

IM for pricing methodologies

7.1.3 Pricing methodologies are the way firms set prices for their goods and services. Firms that are subject to price-quality regulation are generally restricted to setting their prices to recover their efficiently incurred costs (so that they have the opportunity to earn at least normal profits).

7.1.4 In determining the IM for pricing methodologies, the Commission is concerned with how the costs of supplying gas distribution services or gas transmission services (in aggregate) are recovered at a disaggregated level (i.e. from each type of consumer in each geographic area), and the level and structure of prices to recover those costs (e.g. the combination and level of fixed and usage charges).

7.1.5 GPBs currently disclose the pricing methodologies they use under the Gas (Information Disclosure) Regulations 1997³⁴⁹ and pricing methodologies for the controlled gas pipeline services of Powerco and Vector³⁵⁰ are currently regulated under the Gas Authorisation.

7.1.6 As is explained in Chapter 2, unlike the matters listed in s 52T(1)(a), with the exception of some matters in s 52T(1)(a)(iii), pricing methodologies are not relevant to the calculation of allowed revenue; instead they affect how a supplier recovers that revenue. Pricing methodologies are defined under s 52C as:

methodologies for setting the prices of individual goods or services, or classes of goods or services, and includes methodologies for setting different prices for different customer groups.

³⁴⁸ Section 52T(1)(b) was amended by the Electricity Industry Act on 1 November 2010.

³⁴⁹ However, some exemptions apply to Maui Development Limited.

³⁵⁰ Note that Vector's controlled gas pipeline services relate to its Auckland distribution network.

7.1.7 Price is defined under s 52C as:

(a) ... any 1 or more of individual prices, aggregate prices, or revenues (whether in the form of specific numbers, or in the form of formulas by which specific numbers are derived); and (b) includes any related terms of payment.

7.1.8 Some of the matters referred to in s 52T(1)(a)(iii) are relevant to pricing methodologies. Section 52T(1)(a)(iii) requires that the IMs relating to particular goods or services must include, to the extent applicable to the type of regulation under consideration, an IM for the allocation of common costs, including between activities, businesses, consumer classes, and geographic areas.

7.1.9 The allocation of costs between consumer classes and geographic areas is more relevant to pricing methodologies (i.e. s 52T(1)(b)) than to the cost allocation IM. This is because any methodology for setting prices for a particular type of service (e.g. gas distribution services) typically involves the allocation of costs between consumer classes and geographic areas. There are usually significant differences involved in the cost of supplying consumers of various types (e.g. residential consumers versus industrial consumers), and those costs further differ depending on the geographic area where those consumers are supplied.³⁵¹

Application of the IM

7.1.10 Under information disclosure, it is expected that a GPB will be required to disclose the pricing methodology it actually applies, and demonstrate the extent to which it is consistent with the pricing principles specified in the IM. The IM does not apply to DPPs. It does also apply to CPPs, but only to a particular CPP applicant, if (at the time of making its CPP application) the Commission has identified (under information disclosure) that the IM will apply to that supplier.

Structure of this chapter

7.1.11 The remainder of this chapter is structured as follows:

- Section 7.2 sets out the Commission's key considerations in determining the IM; and
- Section 7.3 sets out the Commission's principles-based approach to pricing methodologies and how the IM applies to gas pipeline services under each regulatory instrument.

7.1.12 Appendix I discusses the application of the IM to CPPs in more detail.

³⁵¹ The cost allocation IM deals with the allocation of costs between the different types of regulated services (i.e. gas distribution services, gas transmission services and electricity distribution services) and between regulated and unregulated services (in aggregate) and is discussed in Chapter 3.

Table 7.1 Overview of Pricing Methodologies IM for GPBs only

Approach in IM	Where discussed
A ‘principles-based’ approach applies.	Section 7.3
The pricing principles are consistent with those adopted for the Gas Authorisation, with some minor modifications.	Section 7.3
Under information disclosure, where a GPB must disclose the extent of consistency of the pricing methodology it actually applies with the pricing principles, or the reasons for any inconsistency between its pricing methodology with the pricing principles, the relevant pricing principles are those set out in the pricing methodologies IM.	Section 7.3
The IM does not apply to DPPs.	Section 7.3
The IM applies to CPPs, but only to a particular CPP applicant if (at the time of the supplier making its CPP application) the Commission’s most recent summary and analysis (under information disclosure) has identified that the IM will apply to that supplier.	Section 7.3 and Appendix I
The Commission may amend a pricing methodology a maximum of once per year during the regulatory period. It may only do so where a GPB is proposing to make a material change to the pricing methodology specified in the CPP determination.	Section 7.3 and Appendix I

7.2 Key Considerations in Determining the Pricing Methodologies IM

7.2.1 This section discusses the insights available on pricing methodologies from workably competitive markets and the implications for determining the IM for pricing methodologies.

Insights from workably competitive markets

7.2.2 A key feature of workably competitive markets is that they are allocatively efficient, i.e. they allocate resources to their most valuable uses within the economy.³⁵² Therefore, pricing efficiency is desirable, as pricing is the mechanism that conveys the relative value of goods and services.

7.2.3 Prices that are closer to the long-run marginal costs³⁵³ of supplying services at the requisite quality will increase allocative efficiency (consistent with s 52A(1)(b)). In the case of industries with a high proportion of sunk costs and economies of scale and/or scope, marginal cost pricing is, however, unlikely to yield sufficient revenue to recover the efficiently incurred costs of production due to the substantial economies of scale and/or scope. A firm that does not expect to recover its efficient

³⁵² See Chapter 2 for a discussion of the other two dimensions of efficiency, i.e., productive efficiency and dynamic efficiency.

³⁵³ Long run marginal cost (LRMC) is the change in total costs resulting from the production of one more unit of output assuming that all factors of production are variable. Short run marginal cost (SRMC) is the change in total costs resulting from the production of one more unit of output assuming that all factors of production are fixed. The factors of production are the inputs used in the production of goods or services, such as labour and capital.

costs and make at least a normal return is unlikely to invest in the supply of the regulated services. Therefore, pricing that reflects allocative efficiency is desirable insofar as it is achieved within the constraint that the firm is afforded the opportunity to earn at least a normal return.

- 7.2.4 Simply because prices result in revenues that provide a normal return over time does not mean that they will minimise the allocative inefficiencies caused by departing from marginal cost-based prices. Allocative efficiency is dependent on individual price levels and structures rather than overall revenue, because consumers respond to the prices that they face, rather than the revenues that firms make.

Price setting in workably competitive markets

- 7.2.5 Workably competitive market prices are likely to be subsidy-free.³⁵⁴ However, simply because prices are subsidy-free does not mean that they are efficient. Prices in workably competitive markets are also influenced by consumers' willingness to pay for services and, in particular, the relative demand-responsiveness between:

- two (or more) consumers within a particular consumer group where there are economies of scale in the provision of services of the same type (e.g. by supplying gas distribution services to residential consumers in a particular geographic area). This influences the extent to which prices for different consumers deviate from marginal costs to recover fixed costs; and/or
- two (or more) services where there are economies of scope in the provision of multiple services of the same type (e.g. by supplying gas distribution services to both industrial and residential consumers in a particular geographic area). This influences the extent to which prices for individual services deviate from IC to recover shared costs.

- 7.2.6 In response to a small increase in price, consumers that are more demand-responsive will reduce their demand for a service by more than consumers that are less demand-responsive. Therefore, in workably competitive markets, all else being equal, consumers that are less demand-responsive are likely to face higher prices than consumers that are more demand-responsive.

Implications for determining the IM for pricing methodologies

- 7.2.7 Under price-quality regulation, once regulated revenues are set at a level that is expected to provide a normal return, allocative efficiency will be promoted if, within that overall limitation, suppliers set efficient relative prices for individual services. Consequently, allocative efficiency is particularly relevant to the pricing methodologies that firms apply when setting their charges for regulated services.
- 7.2.8 In determining a pricing methodologies IM, the Commission's objective is to incentivise suppliers to set prices that are more allocatively efficient than would otherwise be the case without regulatory intervention (consistent with s 52A(1)(b)).

³⁵⁴ Prices are defined as subsidy-free if they lie between the IC and SAC of supplying the relevant service (and, in a multi-service firm, of every group of services including that service). See Chapter 3 for further discussion on IC and SAC.

Principles for efficient pricing for GPBs under Part 4

7.2.9 There are a number of principles for allocatively efficient pricing applicable to natural monopolies:

- to the extent that costs are marginal, the associated price components in the price structure should reflect those marginal costs, where practicable;
- efficient prices can depend not just on cost, but on consumers' willingness to pay for a service (with a given quality) as well;
- where one group of consumers is less demand-responsive than another group of consumers of the same service (with a given quality), then—all else being equal—one would expect the prices of the less demand-responsive consumers to be higher relative to the prices of the more demand-responsive consumers; and
- in general, subsidy-free pricing is only a necessary condition for efficient pricing—it is not a sufficient condition.

Benefits and costs of regulatory intervention in pricing

7.2.10 Regulators are frequently urged not to intervene in the pricing decisions of regulated firms because of the complexity in determining consumers' demand-responsiveness, the appropriate bounds on subsidy-free pricing (i.e. IC and SAC), and the appropriate way to convert constraints on revenue into constraints on prices. In particular, given that firms are expected to have access to better demand data than regulators, the imposition of methodologies for deriving regulated prices, within appropriate bounds for subsidy-free prices, may do more economic harm than good. Further complications can arise if regulators are unable to address any pricing distortions that may exist in downstream markets (i.e. gas retailing) that are unregulated.

7.2.11 These factors suggest that regulators ought to act cautiously when intervening in the pricing decisions of regulated firms on a disaggregated basis (i.e. to directly set prices for groups of consumers). However, although firms are often expected to have better demand data than regulators, the incentives to act on that knowledge might be distorted in practice.

7.2.12 In addition, in the absence of workably competitive market incentives, firms might not consider it necessary to address legacy pricing issues (i.e. past pricing policies, or the pricing policies of businesses that the firm has acquired). Moreover, in some cases, the absence of competitive forces may mean that monopolistic firms do not have the information systems in place to capture knowledge about their costs to the extent that firms in a workably competitive market might have. Hence, the problem could be less about information asymmetry between the regulator and the regulated supplier, and more about the possibility that neither party has the relevant information readily available.

7.2.13 The above factors do not necessarily preclude regulatory intervention; rather they inform the extent to which it may be appropriate for a regulator to intervene in the pricing decisions of a firm. Whether the potential net benefits from addressing such pricing concerns will be significant depends on how prescriptive any pricing methodologies mandated by the regulator might be. This is because greater

prescription can increase compliance costs (particularly if major changes are required to the information systems of regulated suppliers).

Summary

7.2.14 Although regulators are primarily focused on constraining overall revenue, they sometimes also set guidelines, principles or rules that affect the pricing methodologies regulated firms can use to determine the prices for regulated services. A key challenge in doing so is ensuring that pricing methodologies lead to recovery of costs provided for in total regulated revenue, but also provide signals that encourage efficient current/future investment and consumption decisions.

7.2.15 In determining the IM for pricing methodologies for GPBs, the following factors are relevant:

- the overall potential for allocative efficiency gains from changes to the prices of individual services or classes of regulated services is typically quite small, given that demand for most types of regulated services is often relatively unresponsive to changes in price;³⁵⁵
- the information needed to determine the allocatively efficient price levels is generally unavailable, which means that regulators may be limited to only shifting prices out of ranges that are demonstrably inefficient (i.e. prices that contain subsidies) so only a small portion of the potential allocative efficiency gains can be realised in practice; and
- putting in place the information systems necessary to appropriately capture cost information is likely to be expensive, as is transitioning systems that are already in place in order to implement new pricing methodologies.

7.3 Pricing Methodologies for GPBs under Part 4

Key features of the IM

7.3.1 The Commission has adopted a principles-based approach to pricing methodologies, with an intermediate level of detail specified in the IM. This is largely based on the principles-based approach adopted for the Gas Authorisations. The following pricing principles have been included in the IM.

Table 7.2 Pricing Principles for GPBs

Pricing Principles
<p>1. Prices are to signal the economic costs of service provision, by-</p> <ul style="list-style-type: none"> a) being subsidy free, that is, equal to or greater than incremental costs and less than or equal to standalone costs, except where subsidies arise from compliance with legislation and/or other regulation; b) having regard, to the extent practicable, to the level of available service capacity; and c) signalling, to the extent practicable, the effect of additional usage on future investment costs.

³⁵⁵ The likely demand responsiveness for gas pipeline services is discussed in Section 3.2 of Chapter 3.

Pricing Principles

2. Where prices based on 'efficient' incremental costs would under-recover allowed revenues, the shortfall is made up by prices being set in a manner that has regard to consumers' demand responsiveness, to the extent practicable.

3. Provided that prices satisfy (1) above, prices are responsive to the requirements and circumstances of consumers in order to-

- a) discourage uneconomic bypass; and
- b) allow negotiation to better reflect the economic value of services and enable consumers to make price/quality trade-offs or non-standard arrangements for services.

4. Development of prices is transparent, promotes price stability and certainty for consumers, and changes to prices have regard to the effect on consumers.

Overview of options

7.3.2 In determining the IM for pricing methodologies, the Commission needed to decide on the appropriate degree of intervention. At the light handed end of the scale, suppliers have complete flexibility to set prices according to their chosen methodology but transparently disclose the information and assumptions used to set those prices. At the heavy handed end of the scale, the Commission would mandate a detailed pricing methodology, which sets disaggregated prices for each consumer group.

7.3.3 The Commission has adopted an intermediate approach, whereby it has developed a set of pricing principles which apply in the following ways:

- to information disclosure, where information disclosure requirements are likely to require demonstration that suppliers' pricing methodologies are consistent with pricing principles; and
- to CPPs (but only in some instances), whereby the Commission will determine a pricing methodology that is consistent with the pricing principles (unless it determines a transitional pricing methodology).

Relevant regulatory decisions and submissions

7.3.4 The Commission has previously adopted a principles-based approach to approving the pricing methodologies of regulated suppliers for the Gas Authorisations,³⁵⁶ which was made in October 2008. The Gas Authorisation primarily controls the weighted average price of the business units of Vector and Powerco that supply controlled gas distribution services. However, the Commission also decided to set pricing principles and guidelines that the suppliers were required to have regard to in developing their pricing methodologies and they were required to submit their pricing methodologies to the Commission for approval.

³⁵⁶ The Gas Authorisation is the only decision by the Commission since 1992, and prior to the 2008 amendment of the Commerce Act, that has involved the control of prices, revenues and/or service quality of gas pipeline services. See Commerce Commission, *Authorisation for the Control of Supply of Natural Gas Distribution Services by Powerco Ltd and Vector Ltd, Decisions Paper*, 30 October 2008.

- 7.3.5 As part of its work for the Gas Authorisations, the Commission reviewed approaches to setting pricing methodologies in overseas jurisdictions, notably in Australia and the UK.³⁵⁷ The Commission found that overseas practice has generally been to follow some variant of an approach that sets pricing principles under which suppliers must develop their pricing methodologies.³⁵⁸
- 7.3.6 Submitters were supportive of an intermediate or principles-based approach, with a similar level of prescription to the pricing principles in that apply under the Gas Authorisations.³⁵⁹ GPBs also emphasised the importance of flexibility in setting their pricing methodologies³⁶⁰ and considered that a principles-based approach was sufficient to meet s 52T(2)(a).³⁶¹

Efficiency benefits

- 7.3.7 Given the limited allocative efficiency benefits available and the lack of information necessary to set efficient prices, the net benefits of heavy-handed regulatory intervention by setting prescriptive pricing methodologies are likely to be small or could even be negative (see Section 7.2 above).
- 7.3.8 Therefore, the Commission considers that a principles-based approach is consistent with the Part 4 Purpose. It is likely to promote allocative efficiency (s 52A(1)(b)) and, to a lesser extent, dynamic efficiency (s 52A(1)(a)) because it provides suppliers with the ability to adjust their prices over time in order to recover their maximum allowable revenues. The approach also minimises the costs of regulation and may reduce the costs to Vector and Powerco of transitioning to the new arrangements under Part 4.

Selection of pricing principles

- 7.3.9 The Commission has adopted the pricing principles that apply under the Gas Authorisations, with some minor adjustments to ensure consistency with the Part 4 Purpose. There was general support from submitters on the GPB Draft Reasons Paper.³⁶²

³⁵⁷ For further information, see Commerce Commission, *Input Methodologies Discussion Paper*, 19 June 2009, pp. 274-275, paragraphs 9.41-9.45.

³⁵⁸ It also found that the key difference between the various regulators is the level of detail in the pricing principles and whether the regulator approves the pricing methodology.

³⁵⁹ Greymouth Gas Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 11; Auckland Energy Consumer Trust, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009, p. 6; Powerco Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 33, paragraph 122; GasNet, *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper*, 9 August 2010, p. 19, paragraph 72; Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 52, paragraph 203; Major Electricity Users' Group, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, Appendix, p. 1.

³⁶⁰ Powerco Limited, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009, pp. 36-37, paragraphs 127-130; Vector Limited, *Submission on Input Methodologies Discussion Paper*, 14 August 2009, pp. 103-104, paragraph 378; GasNet Limited, *Submission on the Input Methodologies Discussion Paper*, 7 August 2009, pp. 33-35.

³⁶¹ GasNet Limited, *Submission on the Input Methodologies Discussion Paper*, 7 August 2009, p. 34; Vector Limited, *Submission on Input Methodologies Discussion Paper*, 14 August 2009, Appendix 2, p. 13.

³⁶² Powerco Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 33, paragraph 122; GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, p.

Applicability to regulatory instruments

Information disclosure

7.3.10 Where GPBs are required to disclose the pricing methodology they actually apply, subject to consultation on information disclosure requirements, it is intended that they will need to demonstrate the extent to which their methodologies are consistent with the pricing principles in the IM. This was supported by submitters.³⁶³ Except in certain circumstances that relate to CPPs (discussed below) GPBs are not required to apply the pricing principles in setting their prices. The disclosure of the actual pricing methodologies applied is important as it will assist interested persons to assess whether suppliers are pricing efficiently (consistent with s 53A).

DPPs

7.3.11 The pricing methodologies IM does not apply to DPPs. All submitters on this issue (except Greymouth Gas)³⁶⁴ supported the Commission's approach.³⁶⁵ However, Mighty River Power and Contact Energy considered that there should be a consistent approach to DPPs and CPPs (see Appendix I).³⁶⁶

7.3.12 The Commission considers that applying the IM to DPPs is likely to be costly, relative to potentially small improvements in allocative efficiency. As all suppliers will be subject to information disclosure, the Commission expects that this will promote compliance with the pricing principles in the IM, without incurring the additional costs of approving actual pricing methodologies under DPPs (consistent with s 53K). The application of the pricing methodologies IM to CPPs (see below) is therefore expected to promote efficient pricing by GPBs.

CPPs

7.3.13 The pricing methodologies IM applies to CPPs (but only in some instances) and can be summarised as follows:

19, paragraph 73; Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 52, paragraph 203; Major Electricity Users' Group, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, Appendix, p. 2.

³⁶³ Greymouth Gas Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 11; Powerco Limited, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009, p. 44, paragraph 154; Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 52, paragraph 201; GasNet, *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper*, 9 August 2010, p. 20, paragraph 74; Major Electricity Users' Group, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, Appendix, p. 2.

³⁶⁴ Greymouth Gas Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 4 and p. 11.

³⁶⁵ Auckland Energy Consumer Trust, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009 p. 6; Vector Limited, *Submission on Input Methodologies Discussion Paper*, 14 August 2009, p. 17, paragraph 49 and p. 102, paragraph 373; Major Electricity Users' Group, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, Appendix, p 2; Powerco Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 33, paragraph 122; GasNet, *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper*, 9 August 2010, p. 20, paragraph 26.

³⁶⁶ Contact Energy Limited, *Submission on the Input Methodologies Discussion Paper*, 31 July 2009, p. 3; and Mighty River Power, *Submission on the Input Methodologies Discussion Paper and the Default Price-Quality Paths for Electricity Distribution Businesses' Discussion Paper*, 29 July 2009, p. 6, paragraphs 29-31 and p. 7, paragraph 33.

- The IM applies to CPPs, but only to a particular CPP applicant where, (at the time of making its CPP application) the Commission's most recent summary and analysis (under information disclosure) identified that the IM would apply to that supplier when making a CPP application.³⁶⁷
- If a supplier is required to submit its proposed pricing methodology as part of its CPP proposal, that pricing methodology must be consistent with the pricing principles. Alternatively, a supplier may propose a transitional pricing methodology that does not meet the pricing principles but which includes a plan to transition to a methodology that does.
- The Commission will determine a pricing methodology that is consistent with the pricing principles for the duration of the CPP regulatory period or a transitional pricing methodology for a period no longer than the CPP regulatory period.
- The Commission may amend a pricing methodology a maximum of once per year during the regulatory period. It may only do so where a GPB is proposing to make a material change to the pricing methodology specified in the CPP determination.³⁶⁸

7.3.14 Where information disclosure has identified that a supplier is applying a pricing methodology that is inconsistent with the pricing principles or the Commission has identified areas of potential concern, the potential efficiency improvements are likely to outweigh the costs of approving the pricing methodology. Otherwise, the benefits of further intervention are likely to be limited.

7.3.15 The Commission considers that targeting its requirements in this way will reduce costs for suppliers, consumers and the Commission. Since any potential issues with price setting should be revealed under information disclosure, suppliers have an incentive to develop pricing methodologies that are consistent with the pricing principles and promote the Part 4 Purpose.

7.3.16 Further details on the application of the IM to CPPs are provided in Appendix I.

³⁶⁷ The Commission is required to publish a summary and analysis of information that is publicly disclosed under s 53B(2).

³⁶⁸ However, the Commission will accept any supplier proposed changes that it determines are not material (see Appendix I).

CHAPTER 8: RULES AND PROCESSES

8.1 Introduction

8.1.1 Section 52T(1)(c) provides that IMs relating to particular goods or services must include, to the extent applicable to the type of regulation under consideration, regulatory processes and rules, such as:

- i. the specification and definition of prices, including identifying any costs that can be passed through to prices;³⁶⁹ and
- ii. identifying circumstances in which price-quality paths may be reconsidered within a regulatory period.

8.1.2 This chapter provides an overview of the rules and processes IMs to apply to default/customised price-quality regulation of EDBs, GDBs and GTBs, and the Commission's reasons for those decisions.

IMs for rules and processes

8.1.3 Section 52T(1)(c) lists two types of rules and processes that must be included in IMs. Section 52T(1)(c) is not limiting; the Commission may include other matters in this IM. The Commission has considered whether any other 'rules and processes' would assist in promoting the Part 4 Purpose.

8.1.4 The Commission has decided that IMs will also include rules on:

- the aggregation of price-quality paths after an amalgamation between suppliers of the same type of regulated services; and
- how an incremental rolling incentive scheme (IRIS) would operate for suppliers on a CPP.³⁷⁰

8.1.5 Including these matters in IMs will promote the Part 4 Purpose by promoting certainty for suppliers and consumers as to how efficiency gains made by suppliers will be treated. Suppliers will therefore face incentives to make efficiency gains in the supply of regulated services (s 52A(1)(b)) and, over time, share those efficiency gains with consumers (s 52A(1)(c)).

8.1.6 Submitters supported the inclusion of these matters in the IMs. However, regulated suppliers proposed that an IRIS should apply to DPPs as well as CPPs (discussed further below). The other key suggestion for inclusion as a regulatory rule or process was the approach to setting starting prices for DPPs (and potentially rates of change and quality standards). This is discussed in Chapter 2 (paragraphs 2.8.39 - 2.8.42) and is not addressed further in this chapter.

8.1.7 In summary, the rules and processes IMs for EDBs and GPBs include:

- the specification and definition of prices;

³⁶⁹ Which may not include the legal costs of any appeals against input methodology determinations under Part 4 or of any appeals under s 91 or s 97.

³⁷⁰ The Commission has previously described a rolling incentive mechanism as an efficiency carryover mechanism. There is no substantive difference in what the Commission means by these terms; rolling incentive mechanism is preferred as it is more commonly used internationally.

- the circumstances in which price-quality paths may be reconsidered within a regulatory period;
- how an IRIS will operate for suppliers on a CPP; and
- the aggregation of price-quality paths after an amalgamation between suppliers of the same type of regulated services.

Application of the IMs for rules and processes

- 8.1.8 The rules and processes IMs will apply to default/customised price-quality regulation. These IMs are not relevant to information disclosure as they relate to how price-quality regulation operates. The rules and processes IMs do not, therefore, apply to consumer-owned EDBs.
- 8.1.9 In determining the IMs for rules and processes for EDBs and GPBs, the main point of disagreement between regulated suppliers and the Commission has been the different application of the rules and processes to DPPs and CPPs (reconsiderations of price-quality paths and the IRIS in particular).
- 8.1.10 Chapter 2 (paragraphs 2.7.7 - 2.7.10 and 2.8.23 - 2.8.28) describes the differences in approach to setting a DPP and a CPP. DPPs are determined based on productivity improvement rates and, although some supplier-specific factors can potentially be taken into account in setting starting price adjustments and alternative rates of change, a DPP is unlikely to be set by undertaking a full assessment of suppliers' forecast expenditure for the regulatory period. This contrasts with overseas jurisdictions such as Australia and the UK, where building blocks analysis is used to set price-quality paths for EDBs and GPBs. Overseas regimes are more similar to the framework that the Commission has developed for determining a CPP, which uses a building blocks analysis and includes an assessment of forecast expenditure.
- 8.1.11 This context is highly relevant to the Commission's decisions on rules and processes for IMs. Where the application of a particular rule or process requires there to be an assessment of forecast efficient expenditure in determining the price-quality path, the Commission has generally applied such rules and processes to the CPP only. Without a 'baseline' to assess proposed changes in expenditure or claimed efficiency gains against, prices may end up being higher than is needed to be consistent with s 52A(1)(d). This may arise through suppliers being rewarded for efficiency gains that they have not made, or for suppliers being compensated for additional costs where some or all of the costs are already sufficiently compensated under a DPP. This is discussed in the context of each relevant rule and process below.

Overview of the IMs and structure of this chapter

- 8.1.12 Table 8.1 provides an overview of the rules and processes IMs. The key features of these IMs are discussed, with additional detail on the components of the IMs described in Appendix J.

Table 8.1 Overview of the Rules and Processes IMs

Overview of IM	Where discussed
<p>Specification of Price</p> <p>Price for EDBs and GDBs is specified by a weighted average price cap. Price for GTBs will be specified by either a weighted average price cap or a total revenue cap. The IMs will include a list of pass-through costs and a process for adding new pass-through costs as well as a list of recoverable costs for each service. The list of pass-through costs includes local authority rates and regulatory levies. Recoverable costs include costs associated with a CPP application; the net incremental carry forward amount under IRIS; claw-back applied by the Commission; for EDBs they include transmission charges; system operator charges; new investment contract charges; and avoided transmission charges; and for GTBs they include costs or credits associated with the sale or purchase of balancing gas.</p>	<p>Section 8.3 and Appendix J, Section J2</p>
<p>Circumstances in which price-quality paths may be reconsidered</p> <p>For all services, a DPP may be reconsidered if a material error is discovered in the determination; or a supplier has provided false or misleading information, which the Commission has relied upon in making its determination.</p> <p>For all services, a CPP may be reconsidered if one of the following events has occurred:</p> <ul style="list-style-type: none"> • a catastrophic event, for which the costs of rectifying the impact of the event is material; or • a material error is discovered in the determination; or • a supplier has provided false or misleading information, which the Commission has relied upon in making its determination; or • a change in legislative or regulatory requirements that has a material impact on costs. <p>In this context, material means that the impact of the event over the remainder of the regulatory period is at least 1% of the aggregated allowable notional revenue for the years in which the costs associated with the event are incurred.</p> <p>A GTB's CPP may also be reconsidered if a trigger event occurs for a project on the contingent project list, or an unforeseen project has commenced or is committed to take place during a CPP regulatory period.</p>	
<p>Incremental Rolling Incentive Scheme (IRIS)</p> <p>The Commission will implement an IRIS under a CPP. The efficiency gain or loss for a particular year will be calculated as the difference between actual and forecast controllable operating expenditure for the current year, minus the difference in the preceding year, the result of which provides the incremental gain / loss for that year.</p> <p>While both incremental gains and losses will be carried forward to the subsequent 5 years, only positive net balances of such gains and losses in years in the next regulatory period will be treated as recoverable costs (i.e. only net rewards will be recognised).</p> <p>The length of time suppliers are allowed to retain the efficiency gain is five years.</p>	<p>Section 8.5 and Appendix J, Section J3</p>

Overview of IM	Where discussed
Aggregation of price-quality paths following an amalgamation	Section 8.6
If a supplier amalgamates with another supplier of the same type of regulated service, the Commission will not reconsider the existing price-quality paths but will require the suppliers involved in the amalgamation to aggregate price-quality paths for compliance purposes from the start of the disclosure year following the amalgamation (if both regulated suppliers are subject to a DPP) or at the expiry of a CPP (if one or more of the regulated suppliers are subject to a CPP).	
Where one or more parties to the amalgamation are already subject to a CPP at the time of the amalgamation, a joint CPP may not apply to the amalgamated supplier until the supplier(s) on a CPP have each completed at least three years of their CPP regulatory period (where applicable) by the time the new CPP is to take effect.	

8.1.13 The remainder of this chapter is structured as follows:

- Section 8.2 discusses the key considerations the Commission has had regard to in setting the rules and processes IMs;
- Section 8.3 discusses the specification of price;
- Section 8.4 discusses the circumstances in which price-quality paths may be reconsidered within a regulatory period;
- Section 8.5 discusses how an IRIS will operate for suppliers on a CPP and why an explicit rolling incentive mechanism is not applied for a DPP; and
- Section 8.6 discusses the aggregation of price-quality paths after an amalgamation.

8.2 Key Considerations in Determining the IM for Rules and Processes

8.2.1 This section discusses the guidance available to the Commission under the Act in setting IMs for the rules and processes specified in paragraph 8.1.7, and the Commission’s interpretation of what that guidance means in relation to these rules and processes.

8.2.2 As indicated in Chapter 2, in setting IMs on the rules and processes, the Commission asked itself what guidance ‘promoting outcomes that are consistent with outcomes produced in [workably] competitive markets’ means for the rules and processes IMs that apply to price-quality regulation.

8.2.3 The Commission is also guided by:

- a. the purpose of IMs (s 52R), i.e. promoting certainty for suppliers and consumers, including in relation to rules and processes; and
- b. the purpose of default/customised price-quality regulation (s 53K), i.e. providing a relatively low cost way of setting price-quality paths while

allowing individual suppliers to have alternative price-quality paths that better meet their particular circumstances.

8.2.4 As discussed above, the different ways in which DPPs and CPPs are set are also relevant.

Insights from workably competitive markets

Incentives to improve efficiency

8.2.5 As discussed in Chapter 2, the promotion of efficiency is a key aspect in workably competitive markets. Competitive pressures tend to move outcomes closer to, rather than further away from, efficient outcomes over time, thereby benefiting consumers.

8.2.6 In workably competitive markets, firms seek to gain competitive advantage through investment and innovation, leading to benefits from efficiency gains through above normal profits. Over time, the competitive process leads to these benefits from efficiency gains being competed away and progressively shared with consumers in the form of lower prices, increased consumer choice, better customer service, better service quality etc. The length of time firms can enjoy the benefits from efficiency gains varies considerably.

8.2.7 In workably competitive markets, firms generally cannot pass cost increases through to prices unless costs have increased for all its competitors; otherwise a more efficient firm could supply the market at a lower price and increase its market share. The extent to which firms are able to pass on any change in costs to consumers will affect their incentives to minimise costs and become more productively efficient.

Mechanisms for dealing with uncertainty and allocation of risk

8.2.8 In workably competitive markets, a range of different arrangements and mechanisms have arisen to deal with uncertainties regarding costs and demand. As discussed in Chapter 2, the economic organisation of an industry or market will depend on the relevant circumstances of the market in question. Some of the factors that might be relevant to how demand and cost uncertainty are addressed include:

- the extent of sunk costs;
- the relative efficiencies of firms within a market; and
- the expectations of demand growth/decline.

8.2.9 In workably competitive markets, each party to a transaction would generally seek to avoid, reduce or share any risk (the mechanism for this depending on the nature of the risk). To the extent that a risk cannot be reduced, it will generally be allocated to the party best placed to bear it. This ensures that the party best placed to manage, control or insure against the risk has an incentive to do so.

Implications for setting IMs for rules and processes under Part 4

8.2.10 Incentive-based price-quality regulation, such as that under Part 4, attempts to provide some of the incentives that rivalry exerts in workably competitive markets, for the long-term benefit of consumers. Although setting any incentive-based price-quality path will provide incentives for suppliers to improve efficiency, the detailed design of the regulatory instruments (in particular, how cost and demand uncertainty

are addressed) will affect the strength of incentives to achieve the objectives in s 52A(1)(a)-(d).

8.2.11 In determining the rules and processes IMs, the Commission has taken into account the following:

- suppliers should have incentives to manage costs efficiently (particularly where they have control over those costs) and to seek efficiencies continuously (consistent with s 52A(1)(b)), and that these incentives can be enhanced where an effective rolling incentive mechanism can be designed;
- suppliers should bear the risks that they are best placed to manage, including risks of any cost variations and demand risk³⁷¹ (consistent with s 52A(1)(b) and (d)); and
- there are a range of mechanisms of varying complexity possible under default/customised price-quality regulation that can be tailored to allocate risk and uncertainty—i.e.:
 - the extent of exposure of regulated suppliers to demand risk can be varied through the appropriate design of the price or revenue cap in the price-quality path;
 - changing circumstances can, in some cases, be appropriately addressed by allowing certain costs to adjust on an annual basis, without requiring a change to the way the price-quality path has been determined; and
 - significant and largely unpredictable events can, in some cases, trigger a partial or full reconsideration of the price-quality path.

8.3 Specification of Price under Part 4

8.3.1 This section sets out the key components of the specification of price IM, and how they apply to default/customised price-quality regulation (i.e. design of the price or revenue cap), namely:

- the form of control; and
- the costs that can be passed through to prices, which are specified in two categories:
 - pass-through costs; and
 - recoverable costs.

8.3.2 Appendix J2 discusses the following components of the specification of price IM:

- the definition of price(s);

³⁷¹ Demand risk refers to the risk that actual demand turns out to be different to that forecast when setting a price-quality path. Depending on how this risk is addressed under the regulatory regime, a supplier may under- or over-recover its allowed revenue.

- the proportion of pass-through costs and recoverable costs that can be passed through to prices;
- the circumstances in which additional costs (other than those already listed as pass-through costs in the IM) can be included as pass-through costs or recoverable costs during a DPP regulatory period; and
- the treatment of various recoverable costs, in particular those that are subject to approval processes.

Form of control

Introduction

- 8.3.3 The key component of the specification of price IM is the ‘form of control’ that is used to cap revenues or prices under default/customised price-quality regulation. As discussed in Chapter 2 (paragraph 2.8.19), Part 4 provides the Commission with a broad discretion to shape the form by which revenues or prices are capped under price-quality regulation. Section 53M(1) allows price-quality paths to be specified in terms of maximum revenues and/or prices, and the definition of ‘price’ (in s 52C) itself means any one or more of individual prices, aggregate prices, or revenues (whether in the form of specific numbers or in the form of formulae by which specific numbers are derived).³⁷²
- 8.3.4 The form of control should provide incentives for efficient behaviour by regulated suppliers (consistent with s 52A(1)(b)) and, depending on the mechanism used, will have different effects on suppliers’ incentives and the allocation of risk between suppliers and consumers. For services subject to price-quality regulation under Part 4, the Commission has primarily considered whether to apply a form of total revenue cap/path or a weighted average price cap/path (introduced in Chapter 2).
- 8.3.5 Total revenue caps are generally considered appropriate where demand risk is largely outside the control of the supplier. Conversely, weighted average price-caps are generally preferred where multiple services (within the same regulated service) are supplied and where demand can be influenced to a reasonable extent by the supplier.
- 8.3.6 In considering whether suppliers or consumers are best placed to bear demand and cost risks, the following factors are relevant:
- the nature and size of the customer base;
 - the extent to which a supplier can control or predict a cost;
 - the extent of contracting undertaken between suppliers and their customers;
 - the volatility of demand; and
 - the extent to which costs are fixed or variable.

³⁷² Under s 53M(1)(a), every price-quality path must specify, in relation to prices, the maximum price or prices that may be charged by a regulated supplier; and/or the maximum revenues that may be recovered by a regulated supplier, with respect to a specified regulatory period.

Form of control for EDBs and GDBs

8.3.7 For EDBs and GDBs (where multiple services are supplied and where demand can be influenced to a reasonable extent by the supplier), maximum prices that may be charged, or revenues that may be recovered, will be specified by a weighted average price cap. The weighted average price cap is defined in terms of a relationship between notional revenue³⁷³ and allowable notional revenue,³⁷⁴ which are both defined to the extent appropriate in the IM so that suppliers can estimate the material effect of the form of control on them. In the case of EDBs, this definition ensures that the revenue differential term included in the DPP is also provided for.³⁷⁵ The specification of price IM also defines how costs that can be passed through to prices are treated, i.e. the actual costs are netted-off notional revenue in assessing compliance. Such costs are therefore not required to be included in the calculation of allowable revenue under either a DPP or CPP. Which costs can be passed through to prices is discussed in paragraphs 8.3.22 to 8.3.39 below.

8.3.8 A weighted average price cap has a number of features that make it appropriate for the regulation of electricity distribution services and gas distribution services, particularly with regard to the promotion of efficiency. For example, a weighted average price cap:

- generally provides incentives to price efficiently, subject to the overall revenue constraint being met, as regulated suppliers can utilise their knowledge of consumers' price responsiveness when pricing to maximise profits and manage demand risk – potentially reducing allocative inefficiency;
- allocates the demand risk to regulated suppliers – which is appropriate as they are generally better placed than their consumers to manage this risk;
- provides incentives to invest in new infrastructure and to connect new consumers to the network, as it provides the regulated suppliers with additional revenue for new consumers and new volume immediately;
- is suitable for situations where the (multiple) services supplied are relatively small in number and do not change regularly – meaning the 'tariff basket' of services is reasonably stable; and
- is familiar to electricity and most gas distribution businesses.

8.3.9 Previously, the Commission has used a weighted average price cap for the Gas Authorisation that applies to the controlled gas distribution services of Powerco and Vector.³⁷⁶ The existing DPPs for EDBs under Part 4 are also weighted average price caps, as was the prior price path thresholds for EDBs under the old Part 4A.

³⁷³ For EDBs and GDBs, notional revenue is defined in clause 3.1.1(3) of the relevant IM determination. For GTBs, notional revenue is defined in clause 3.1.1(5) of the IM determination.

³⁷⁴ For EDBs and GDBs, allowable notional revenue is defined in clause 3.1.1(2) of the relevant IM determination. For GTBs, allowable notional revenue is defined in clause 3.1.1(4) of the IM determination.

³⁷⁵ Commerce Commission, *Decision 704: Amendment to Decision 685 – Commerce Act (Electricity Distribution Default Price-Quality Path) Determination 2010*, 30 November 2010.

³⁷⁶ Commerce Commission, *Decision 656: Powerco Gas Authorisation*, 30 October 2008; Commerce Commission, *Decision 657: Vector Gas Authorisation*, 30 October 2008.

- 8.3.10 Submissions from EDBs on the form of control generally supported the use of a weighted average price cap.³⁷⁷ However some submitters consider that this may need to be reconsidered (and the IM amended) in light of any further work on energy efficiency and quality incentives.³⁷⁸ Unison suggested that EDBs should be allowed to opt for a revenue cap,³⁷⁹ or hybrid form of price cap, whereby an ‘unders and overs’ account can operate.³⁸⁰
- 8.3.11 Even though some submitters considered otherwise,³⁸¹ by providing EDBs the flexibility to adjust their pricing structures, the Commission is promoting incentives and, in particular, is avoiding imposing disincentives for EDBs to invest in energy efficiency including demand-side management, consistent with s 54Q of the Act. EDBs may employ this flexibility to adjust pricing structures to promote energy efficiency, and demand side management in particular, by removing reliance on simplistic volumetric pricing and by allowing the introduction of peak demand and/or time-of-use pricing, as well as an increased proportion of fixed to variable charges where appropriate.
- 8.3.12 Submitters also generally supported the use of a weighted average price cap for gas distribution services.³⁸²

Application under default/customised price-quality regulation

- 8.3.13 The same form of control will apply for suppliers on a DPP and a CPP under default/customised price-quality regulation. The form of control is set in the context of which party is best placed to manage demand risk - suppliers or consumers. This does not change in moving from a DPP to a CPP.

Form of control for GTBs

- 8.3.14 As noted in paragraph 8.3.3, Part 4 contemplates that a price-quality path in respect of a single type of regulated service may be subject to either or both a price cap and a revenue cap (s 53M(1)(a)). The ways in which gas transmission services are supplied in New Zealand, in particular the specific capacity reservation arrangements and lack of contractual flexibility in certain cases, warrant the extra complexity and

³⁷⁷ Orion, *Submission on Input Methodologies: Draft Determination and Reasons Papers for Electricity Distribution Businesses*, 9 August 2010, p. 16, paragraph 5.1.

³⁷⁸ ENA, *Submission 5 Processes and Rules Input Methodology*, 9 August 2010, p. 8, paragraphs 34-35; Powerco, *Submission 1 in Response to Draft Input Methodology and Information Disclosure Determinations*, 9 August 2010, p. 35, paragraph 129; Wellington Electricity, *Submission to the Commerce Commission on Draft Input Methodologies (Electricity Distribution)*, 9 August 2010, p. 11, paragraph 6.2(i).

³⁷⁹ Vector also submitted that suppliers should not be limited to a weighted average price cap if they apply for a CPP (Vector, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, p. 58, paragraph 220).

³⁸⁰ Unison, *Submission on Commerce Commission Draft Input Methodology Determinations: Regulatory Tax, Cost allocation Pricing Methodologies Rules and Processes*, 9 August 2010, p. 27, paragraph 92.

³⁸¹ ENA, *Submission 5 Processes and Rules Input Methodology*, 9 August 2010, p. 7, paragraph 28; Vector, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, pp. 69-70, paragraphs 270-273; Wellington Electricity, *Submission to the Commerce Commission on Draft Input Methodologies (Electricity Distribution)*, 9 August 2010, p. 11, paragraph 6.2(i).

³⁸² For example: AECT, *Submission to the Commerce Commission on its Issues Paper (On the Form of Control) for the Initial DPP for Gas Pipeline Businesses*, 30 April 2010, p. 2; GasNet, *Input Methodologies (Gas Pipeline Services) Draft Reasons Paper and Draft Determinations*, 9 August 2010, p. 20, paragraph 78; Powerco, *Submission 1 in Response to Draft Input Methodology and Information Disclosure Determinations*, 9 August 2010, p. 35, paragraph 129; Vector, *Submission on Gas DPP Issues Paper - Form of Control*, 30 April 2010, p. 4.

flexibility afforded by specifying price in terms of both a weighted average price cap and a total revenue cap.

- 8.3.15 The Commission has determined that a regulated supplier whose business profile is characterised by the following factors is better suited to a total revenue cap than a weighted average price cap:
- a. capacity reservation arrangements managed through common carriage rather than contract carriage; and
 - b. a lack of contractual flexibility to tailor non-standard pricing arrangements for individual customers.
- 8.3.16 A supplier operating under a common carriage capacity reservation agreement has little influence over the gas volumes transported through its pipelines. Where demand is subject to significant variability over the price review period, a weighted average price cap may lead to insufficient revenues being recovered to cover costs. In such circumstances, consumers can be expected to be better placed to deal with demand risk and hence a total revenue cap is more appropriate. As they are closer to the underlying determinants of demand for gas consumption, consumers can be expected to have access to better information than the supplier. This allows consumers to deal with demand risk through alternative strategies. A supplier may also attempt to manage demand risk resulting from the common carriage arrangement by attempting to expand demand through flexible pricing with existing or new customers. If a supplier does not have this flexibility, the ability to deal with demand risk is further reduced.
- 8.3.17 The Maui Pipeline Operating Code (MPOC) sets out in Schedule 10 a set of tariff principles which effectively require Maui Development Limited (MDL) to charge all shippers the same tariffs. MDL may not unilaterally change the MPOC, and it is therefore not able to influence demand by offering non-standard contracts. By contrast, the Vector Transmission Code (VTC) does not require Vector to charge all shippers the same tariffs. As a consequence, Vector is able to offer non-standard contracts and set different tariffs for each.
- 8.3.18 The Commission has, therefore, included criteria based on the factors in paragraph 8.3.15 in the specification of price IM for GTBs. The Commission will be guided by these criteria when determining whether a total revenue cap or weighted average price cap should be applied in respect of a particular GTB. These criteria do not represent a clean dichotomy (this was supported by Vector³⁸³). Accordingly, whether particular regulated suppliers should be subject to a total revenue cap or weighted average price cap will be a matter of judgement on the part of the Commission after considering these criteria.
- 8.3.19 For each GTB, maximum prices that may be charged, or revenues that may be recovered, will therefore be specified by either a weighted average price cap or a total revenue cap. In both circumstances, the cap is defined in terms of a relationship between notional revenue and allowable notional revenue, which are both defined in the IM to the extent appropriate so that suppliers can estimate the material effect of

³⁸³ Vector, *Submission on Gas DPP Issues Paper - Form of Control*, 30 April 2010.

the form of control on them. As outlined for EDBs and GDBs above, the specification of price IM also defines how costs that can be passed through to consumers are treated, i.e. they are netted off notional revenue.

Application under default/customised price-quality regulation

- 8.3.20 Vector submitted that “suppliers must be given the opportunity to comment on fully developed price cap and total revenue cap proposals before a final decision is made”³⁸⁴ and proposed that GTBs be provided with a one-off opportunity to choose between a price or total revenue cap.³⁸⁵ The Commission will apply the criteria in the IM in determining the appropriate form of control for each GTB prior to the commencement of the first DPP regulatory period. All interested parties will have an opportunity to comment during that process before a final decision is made as to which form of control should apply.
- 8.3.21 The Commission may undertake a reassessment of the form of control to apply at each DPP reset, as the supplier-specific circumstances that informed the original decision may have changed. The same form of control can be expected to be applied under a CPP as a DPP unless the supplier-specific circumstances have changed since the DPP was set, i.e. the same criteria will be applied by the Commission in determining a CPP.

Costs that can be passed through to prices

Introduction

- 8.3.22 The specification and definition of price IM must include the costs that can be passed through to prices. The types of costs that are typically allowed to be passed through during a regulatory period, once the actual amount is known, are those costs that are outside the control of a regulated supplier and are uncertain in terms of the amount.
- 8.3.23 There are, however, some partially controllable costs that it may be appropriate to allow to be fully recoverable from consumers. In particular, this is the case where the costs associated with applying a mechanism to provide incentives for the supplier to manage the risk are likely to outweigh the benefits to consumers of doing so, based on currently available information. As better information becomes available, it may be cost effective for such incentive mechanisms to be developed for future regulatory periods. For instance, price-quality paths are set in advance for three to five years (except where a regulated supplier transitions from a DPP to a CPP at an earlier date) and forecasting some costs over such a period may be very difficult, particularly where there is significant inherent variability in the cost, and there is limited information currently available about the extent of that variability. Such costs may also only be controllable by the supplier at the margin.
- 8.3.24 There are some circumstances under which a broader reconsideration of the price-quality path may be required, and simply passing through costs is not appropriate. These circumstances are discussed further in Section 8.4.

³⁸⁴ Vector, *Submission in response to the Commerce Commission’s Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, p. 66 paragraph 255.

³⁸⁵ Vector, *Submission in response to the Commerce Commission’s Revised Draft Determinations and Consultation Update Papers for Electricity Distribution Businesses and Gas Pipeline Businesses*, 12 November 2010, p. 12 paragraph 45.

Categories of costs that can be passed through

8.3.25 The Commission has decided to allow a range of costs for EDBs and GPBs to be passed through to prices. Some are relevant to both EDBs and GPBs; others are service-specific. The Commission has put these costs into two categories. The first category is called ‘pass-through costs’ and the second is called ‘recoverable costs’. The main distinction between these two categories is the extent to which they are controllable by the regulated supplier. Pass-through costs are those costs that are outside the control of the supplier and can be passed through to consumers without the Commission needing to undertake any assessment of these costs.

8.3.26 Some submitters disagreed with having a separate, recoverable costs category, rather than include them as pass-through costs.³⁸⁶ Vector submitted that there would be “less certainty that [recoverable costs] will be continued to be passed through in future years”.³⁸⁷ The Commission has decided to distinguish the costs in this way as it anticipates that over time it will be appropriate to reconsider the list of recoverable costs and whether they are appropriate to continue to be fully passed through to consumers. Some form of partial pass-through may be used to incentivise suppliers in how they manage the costs. Practically speaking, however, there is little difference between the categories because:

- the mechanism for recovering the pass-through and recoverable costs is the same, i.e. they are netted-off notional revenue in assessing compliance annually under either a DPP or a CPP;
- the full amount of the cost can be passed through to prices (unless it is subject to approval as discussed below); and
- the IM does not provide the Commission with the discretion to simply amend the list of pass-through costs or recoverable costs, nor the proportion that can be passed through. The Commission must follow the process for amending an IM set out in ss 52X and 52V.

8.3.27 The main difference between pass-through and recoverable costs is that recoverable costs are not completely outside the control of the supplier and there may be judgement involved as to how much should be passed through. In some cases, the Commission has required the costs be subject to an approval process before they can be passed through (namely, NIC charges, avoided transmission charges and (for GTBs) gas balancing costs or credits). The specific approval requirements are

³⁸⁶ Orion, *Submission on Input Methodologies: Draft Determination and Reasons Papers for Electricity Distribution Businesses*, 9 August 2010, pp. 20-21, paragraphs 5.18-5.19; Powerco, *Submission 1 in Response to Draft Input Methodology and Information Disclosure Determinations*, 9 August 2010, pp. 35-36, paragraph 133; PwC, *Submission to the Commerce Commission Input Methodologies for Electricity Distribution Services Draft Reasons Paper and Associated Draft Determinations (1) Cost Allocation, Regulatory Tax, Pricing Methodologies and Rules and Processes*, 9 August 2010, p. 22, paragraph 72; Unison, *Submission on Commerce Commission Draft Input Methodology Determinations: Regulatory Tax, Cost allocation Pricing Methodologies Rules and Processes*, 9 August 2010, p. 31, paragraph 111; Vector, *Submission in response to the Commerce Commission’s Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, pp. 67-69, paragraphs 262-266; Wellington Electricity, *Submission to the Commerce Commission on Draft Input Methodologies (Electricity Distribution)*, 9 August 2010, p. 12, paragraph 6.2(iii).

³⁸⁷ Vector, *Submission in response to the Commerce Commission’s Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, p. 68, paragraphs 264.

discussed in relation to each recoverable cost in Appendix J (paragraphs J2.22 - J2.27, and J2.31 - J2.34).

8.3.28 The remainder of this section sets out:

- the pass-through costs for each regulated service; and
- the recoverable costs for each regulated service.

8.3.29 This section also discusses why other costs proposed by regulated suppliers (e.g. costs of implementing new regulations or catastrophic events) are not being included as either pass-through or recoverable costs.

Pass-through costs - all services

8.3.30 The same pass-through costs will apply to suppliers under both the DPP and any CPP (unless additional pass-through costs are added to a CPP, discussed in Appendix J2, paragraphs J2.13- J2.15 below). The pass-through costs that apply to both EDBs and GPBs are:

- a. local authority rates, meaning rates on system fixed assets paid or payable by a regulated supplier to a local authority under the Local Government (Rating) Act 2002; and
- b. Commerce Commission levies payable under s 53ZE of the Commerce Act.

8.3.31 The following are service-specific pass-through costs:

- a. for EDBs, levies payable under the Electricity Industry Act 2010;
- b. for GPBs, levies payable under the Gas Act 1992;
- c. for GDBs and EDBs, levies payable by all members of the Electricity and Gas Complaints Commissioner Scheme by virtue of their membership; and
- d. for GDBs, levies payable under the Commerce (Levy for Control of Natural Gas Services) Regulations 2005.

8.3.32 Suppliers supported the inclusion of the pass-through costs listed above. However, MEUG did not agree that rates or levies should be included as pass-through costs because they are not entirely outside the control of the supplier (as the supplier can and should make submissions to rating authorities), are relatively small and there would be benefits in simplifying the calculation and reporting.³⁸⁸

8.3.33 The Commission has decided that it is appropriate for such rates and levies to be passed through to consumers, because these costs may be material and are reasonably incurred in the supply of regulated services. In addition, as EDBs and GPBs are not the only ratepayers, their specific ability to control or influence these costs is limited.

³⁸⁸ Major Electricity Users' Group, *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper, Cost Allocation, Treatment of Taxation, Pricing Methodologies, Rules and Processes and Transpower asset value*, 9 August 2010, Appendix pp. 2-3.

Recoverable costs - all services

8.3.34 The recoverable costs that apply to both EDBs and GPBs are:

- a. costs associated with a CPP application that the Commission considers should be recovered by a supplier, provided the application is not rejected for incompleteness or otherwise discontinued, and which include fees payable to verifiers, auditors or engineers (subject to approval) (discussed further in Appendix K);
- b. under a CPP only, any positive net incremental balances under the IRIS (discussed in Section 8.5 below); and
- c. claw-back applied by the Commission under s 53ZB(3) (under both a DPP and CPP).

8.3.35 The following are service-specific recoverable costs:

- a. for EDBs:
 - i. transmission charges, being those charges payable by an EDB under the Transmission Pricing Methodology³⁸⁹ (not subject to approval by the Commission);
 - ii. system operator charges payable by an EDB for the supply of such system operator services not otherwise paid by an EDB in Electricity Authority levies (which are pass-through costs) (not subject to approval by the Commission);
 - iii. new investment contract (NIC) charges, which are charges payable by an EDB under an NIC with Transpower, or an equivalent contract with another transmission provider (subject to approval by the Commission);
 - iv. avoided transmission charges, which occur when an EDB purchases transmission assets from Transpower and subsequently lowers transmission charges (or NIC charges) to the EDB. To provide incentives to suppliers to undertake such transactions, the full amount of avoided transmission charges that are approved by the Commission may be recovered via this mechanism for a period of five years (subject to approval by the Commission);
 - v. avoided transmission charges arising from the connection of distributed generation, determined in accordance with Schedule 6.4 of Part 6 of the Electricity Industry Participation Code (not subject to approval by the Commission); and
 - vi. claw-back applied by the Commission under s 54K(3) (for DPPs only);
- b. for GPBs: claw-back applied by the Commission under s 55F(2) and s 55F(4) (for DPPs only); and
- c. for GTBs: a cost or a credit arising from the GTB's purchase or sale of balancing gas that has not been allocated to persons shipping gas on the GTB's network (subject to approval by the Commission).

³⁸⁹ Schedule 12.4 of the Electricity Industry Participation Code.

Other costs sought to be passed through by submitters

- 8.3.36 Submitters on the Draft Reasons Paper suggested that the costs of responding to a catastrophic event or a change in legislative or regulatory requirements should be included as pass-through costs, rather than suppliers on a DPP having to apply for a CPP, and suppliers on a CPP having to apply for reconsideration of the CPP.³⁹⁰ Wellington Electricity submitted that these types of events (as well as several other events) are treated as ‘pass-through events’ under the Australian National Electricity Rules (NER).³⁹¹
- 8.3.37 Under the NER, price-quality paths for all suppliers are determined using building blocks analysis (which means there is a baseline for forecast expenditure to assess incremental changes against). The proposed costs associated with a pass-through event undergo an approval process³⁹² (similar to the Commission’s process for assessing applications for a CPP or for reconsideration of a CPP), taking into consideration any costs that can be deferred, such as routine maintenance. This was recognised by Wellington Electricity, who submitted that “there would need to be a full assessment of the efficiency and prudence of the costs associated with these events before they could be recovered or paid back to consumers”.³⁹³
- 8.3.38 The NER pass-through event process is therefore quite different from the Commission’s pass-through process; it is more like the reconsideration of price-quality paths. The Commission’s pass-through process enables specific costs that are outside the control of the supplier to be passed-through to consumers without further consideration by the Commission. In the case of catastrophic events or legislative change, although the event may be outside of the control of a supplier, the costs associated with responding to the event are not. Consequently, it is not appropriate for the costs of responding to a catastrophic event or legislative change to be treated as pass-through costs under Part 4.
- 8.3.39 The key issue for submitters, however, was not whether they are classified as ‘reconsiderations of the price-quality path’ instead of ‘pass-through / recoverable costs’; the key issue was whether the additional costs can be recovered under the DPP or whether the supplier would be expected to apply for a CPP. This matter is discussed in the section on the IMs for reconsideration of price-quality paths (paragraphs 8.4.14 to 8.4.20 below).

³⁹⁰ ENA, *Submission 5 Processes and Rules Input Methodology*, 9 August 2010, pp. 12-13, paragraphs 56-59; GasNet, *Input Methodologies (Gas Pipeline Services) Draft Reasons Paper and Draft Determinations*, 9 August 2010, p. 21, paragraph 80; Powerco, *Submission 1 in Response to Draft Input Methodology and Information Disclosure Determinations*, 9 August 2010, p. 35, paragraph 132; PwC, *Submission to the Commerce Commission Input Methodologies for Electricity Distribution Services Draft Reasons Paper and Associated Draft Determinations (1) Cost Allocation, Regulatory Tax, Pricing Methodologies and Rules and Processes*, 9 August 2010, p. 23, paragraphs 75-76; Vector, *Submission in response to the Commerce Commission’s Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, pp. 67-68, paragraphs 262-263.

³⁹¹ Wellington Electricity, *Submission to the Commerce Commission on Draft Input Methodologies (Electricity Distribution)*, 9 August 2010, pp. 13-14, paragraph 6.2(iii).

³⁹² For example, section 6A.7.3 of the NER (v.39) for electricity transmission service.

³⁹³ Wellington Electricity, *Submission to the Commerce Commission on Draft Input Methodologies (Electricity Distribution)*, 9 August 2010, p. 15, paragraph 6.2(iv).

8.4 Reconsideration of Price-Quality Paths under Part 4

Introduction

- 8.4.1 The Commission sets price-quality paths on an *ex ante* basis for a 3 to 5 year period. To maximise incentives for suppliers to behave efficiently, the rules on when a price-quality path may be reconsidered should where possible be clearly specified. For instance, where the rules are not clear, suppliers may be concerned that significant efficiency gains might be viewed as excessive profits and result in pressure for the regulator to reduce prices within the period. In addition, a supplier may not take appropriate action to mitigate risks that it is best placed to manage, as it may assume that consumers will be required to compensate it through increased prices or by accepting lower quality should the risk eventuate. However, there are other circumstances, such as where the price-quality path was set on incorrect information, where the basis for the price-quality path is clearly inappropriate and should be reconsidered.
- 8.4.2 On this reconsideration point, and specifically in relation to the Commission's power of amendment under s 52Q, ENA submitted that the Commission has no power to reopen the DPP midterm other than:
- to correct errors and omissions;
 - consequential on appeal from an IM; or
 - in response to a reopener event (as stipulated *ex ante* in the relevant IM).³⁹⁴
- 8.4.3 The Commission does not accept ENA's characterisation of s 52Q but accepts that the circumstances in which price-quality paths can be reconsidered must be read in light of the reconsideration provisions in the IM. However, the IM is not required to list all the circumstances under which a s 52P determination may be amended. For example:
- a. Section 52P determinations include matters other than the price-quality path. The Commission may amend such other matters under s 52Q.
 - b. The Commission may also be required to reconsider the price-quality path using s 52Q to fulfil its statutory obligations. For instance, under s 26 of the Act the Commission is required to have regard to certain statements of Government economic policy.
 - c. Under s 54V(2) the Commission is required to take into account certain decisions made under the Electricity Industry Act 2010, and under s 54V(3) must reconsider a s 52P determination if asked to do so by the Electricity Authority and amend the determination if that is appropriate to take account of those decisions.³⁹⁵ As these are statutory obligations, it is not necessary to include them in the IM; the Commission considers it can exercise its power under s 52Q to make such amendments, if required.

³⁹⁴ ENA, *Submission on Default Price-Quality Path Refinements*, 27 September 2010, paragraph 31.

³⁹⁵ Similar provisions apply in respect of gas pipeline services under the Act (s 55I).

- 8.4.4 The remainder of this section sets out:
- a. how the circumstances under which price-quality paths may be reconsidered should be specified in the IM;
 - b. the circumstances in which a price-quality path may be reconsidered for suppliers under default/customised price-quality regulation, including the Commission's response to submissions that the same reconsideration events should apply under both a DPP and a CPP;
 - c. the treatment of catastrophic events under default/customised price-quality regulation; and
 - d. the application of the IM.

Defining circumstances in which price-quality paths can be reconsidered

- 8.4.5 The Commission's approach to specifying circumstances in which price-quality paths can be reconsidered is to define broad types of events, and the characteristics specific to each event type that would lead the Commission to reconsider the price-quality path. A key component of this approach is to ensure that there is an objective measure of when reconsideration is triggered. A materiality threshold, defined by reference to the impact of the event on the price path (which will have already been determined prior to the event occurring), is used for this purpose. In the context of deciding whether to reconsider a price-quality path under Part 4, 'material' means the total effect of the event on the price path is at least 1% of the aggregated allowable notional revenues for the affected years.³⁹⁶
- 8.4.6 The threshold is based on the impact on revenue for suppliers as all types of costs can be reflected in these terms. For instance, the costs of rectifying an event may involve both opex and capex. Each can be translated into an effect on revenue. The threshold also allows events to be treated equally regardless of the year in which they occurred.
- 8.4.7 As discussed above (paragraphs 8.3.36-8.3.38), the Commission's reconsideration of price-quality paths is similar to the pass-through event mechanism used by the Australian Energy Regulator (AER) for transmission and distribution businesses. Pass-through events in the Australian regime include regulatory changes, tax changes and terrorism events, among others.³⁹⁷ The materiality threshold used by the AER is broadly the same as the Commission's, i.e. 1% of annual revenues per event.
- 8.4.8 The above approach to defining the circumstances for reconsidering price-quality paths under Part 4 provides a balance between:

³⁹⁶ Submitters were supportive of the approach to defining circumstances for reconsideration, including the materiality threshold of 1% revenue per annum (for example: Maui Development Limited, *Submission on GPBs Revised Input Methodologies Draft Determination Part 5*, 18 November 2010, p. 5, paragraphs 5.4-5.5; Transpower New Zealand Limited, *Tabular Submission on the Draft Input Methodologies (Transpower) Determination and Draft Reasons Papers*, 9 August 2010, p. 34; Vector, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, p. 54, paragraph 208.

³⁹⁷ Refer to Australian National Electricity Rules, Chapters 6, 6A and 10.

- the need to ensure that a supplier can seek a reconsideration of the price-quality path if an event is so material in terms of financial effects on the business, that the existing path is no longer appropriate; and
- the need to appropriately restrict the circumstances or events under which a path may be reconsidered. Reconsidering a price-quality path could be a costly and time consuming task, and leaving the criteria too broad could give rise to moral hazard.³⁹⁸ As a result, price-quality paths should only be reconsidered in circumstances where the benefit of reconsidering the path is expected to outweigh the likely cost (including both immediate and longer term costs), with other risks the responsibility of the supplier.

Circumstances in which price-quality paths may be reconsidered

- 8.4.9 The circumstances in which a price-quality path may be reconsidered will vary for suppliers under the DPP and CPPs. Unlike overseas jurisdictions, suppliers on a DPP have the opportunity to apply for a CPP to better suit their particular circumstances if they consider that the DPP is not appropriate for them. However, suppliers on a CPP may not apply for a new CPP during a regulatory period. It is therefore appropriate to have a broader set of circumstances under which a CPP may be reconsidered. It is also practicable to reconsider a CPP due to the availability of an efficient baseline for forecast expenditure.
- 8.4.10 There are also some circumstances that will apply to GTBs only, due to the nature of gas transmission services, where large and lumpy investment profiles are typical.
- 8.4.11 A DPP may be reconsidered under the IM for reconsideration of price-quality paths if:
- a material error is discovered in the determination; or
 - a supplier has provided false or misleading information to the Commission, which the Commission has relied upon in making its determination.
- 8.4.12 A CPP may be reconsidered under the IM for reconsideration of price-quality paths if one of the following events has occurred:
- a catastrophic event, for which the costs of rectifying the effect of the event are material; or
 - a material error is discovered in the determination; or
 - a supplier has provided false or misleading information to the Commission, which the Commission has relied upon in making its determination; or
 - a change in legislative or regulatory requirements that has a material effect on costs; or

³⁹⁸ Moral hazard refers to the situation where the regulated supplier would not be sufficiently incentivised to minimise the costs or likelihood of events that constitute a reconsideration of the price-quality path.

- for GTBs only: a trigger event for a project on the contingent project list (as set out in a s 52P determination); or
- for GTBs only: an unforeseen project has commenced or is committed to take place during the CPP regulatory period.

8.4.13 The GTB-specific reconsideration circumstances are discussed in Chapter 9 on CPP Requirements.

Submitters' preference for application to both DPP and CPP

8.4.14 Regulated suppliers were generally supportive of the approach to specifying circumstances in which price-quality paths may be reconsidered (discussed above). They were also supportive of the scope of the circumstances for reconsideration of a CPP.³⁹⁹ The key point of difference between the Commission and regulated suppliers has been whether the same events should apply to suppliers under a DPP as a CPP.⁴⁰⁰ Further, Vector submitted that the limited circumstances in which DPPs can be reconsidered is an approach inconsistent with the intended operation of the DPP/ CPP framework and the intent of the Act.⁴⁰¹

8.4.15 Regulated suppliers do not agree that different provisions should apply to suppliers on DPPs and CPPs. Several submitters argued that suppliers on the DPP should not be subjected to what they variously considered to be the slow, cumbersome and high-cost process to apply for a CPP.⁴⁰² Other submitters considered that costs arising from such events should be treated as pass-through costs (discussed in paragraphs 8.3.36-8.3.38 above). For example, PwC submitted:

...new legislation which imposes additional costs on the supplier should also be included as pass-through costs. PwC do not accept the reasoning in the Draft Reasons Paper that such costs are already partly within the DPP as they include allowances for historical costs of meeting regulation. ... These are not appropriate for a CPP as they will impact on the entire industry. EDBs have no other mechanism for recovering any additional

³⁹⁹ For example: Powerco, *Submission 1 in Response to Draft Input Methodology and Information Disclosure Determinations*, 9 August 2010, pp. 39-40, paragraph 154; Vector, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, p. 60, paragraph 227.

⁴⁰⁰ ENA, *Submission 5 Processes and Rules Input Methodology*, 9 August 2010, pp. 12 and 17, paragraphs 54-55 and 74-75; GasNet, *Input Methodologies (Gas Pipeline Services) Draft Reasons Paper and Draft Determinations*, 9 August 2010, p. 22, paragraphs 84-85; Powerco, *Submission 1 in Response to Draft Input Methodology and Information Disclosure Determinations*, 9 August 2010, pp. 39-40, paragraphs 154-155; PwC, *Submission to the Commerce Commission Input Methodologies for Electricity Distribution Services Draft Reasons Paper and Associated Draft Determinations (1) Cost Allocation, Regulatory Tax, Pricing Methodologies and Rules and Processes*, 9 August 2010, pp. 24-25, paragraphs 81-83; Vector, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, p. 59-60, paragraph 225-226; Unison, *Submission on IM Discussion Paper*, 14 August 2009, Q. 26.

⁴⁰¹ Vector, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, pp. 57-59, paragraph 220.

⁴⁰² ENA, *Submission 5 Processes and Rules Input Methodology*, 9 August 2010, p. 12, paragraph 54; GasNet, *Input Methodologies (Gas Pipeline Services) Draft Reasons Paper and Draft Determinations*, 9 August 2010, p. 22, paragraph 85; Powerco, *Submission 1 in Response to Draft Input Methodology and Information Disclosure Determinations*, 9 August 2010, pp. 39-40, paragraphs 154-155; Unison, *Submission on Commerce Commission Draft Input Methodology Determinations: Regulatory Tax, Cost allocation Pricing Methodologies Rules and Processes*, 9 August 2010, p. 27, paragraph 91.

regulatory compliance costs during a DPP. In PwC's view this is not a reasonable allocation of risk to EDBs.⁴⁰³

- 8.4.16 Submitters also did not agree with the Commission that it is not appropriate to reconsider a price-quality path without building blocks analysis being used to determine efficient baseline information that can be adjusted incrementally, taking into account factors such as potential changes to planned expenditure. ENA submitted that:

The Commission also considers that a DPP provides an inadequate baseline against which to make incremental adjustments. This is not so. A DPP is designed to approximate the recovery of an EDBs annual costs and it follows that if an event gives rise to a change in those annual costs, then the DPP could be adjusted to reflect those changes in costs. In any event, for the purpose of recovering the costs associated with a legislative change or catastrophic event, it will be necessary to simply ring fence the incremental costs incurred by the business in responding to the event and to allow the EDB to recover these costs.⁴⁰⁴

- 8.4.17 The Commission rejects ENA's submission. A supplier may be able to identify costs that are associated with responding to an event but that does not mean that all of those costs should be passed through to consumers. For example, it is reasonable to expect that where suppliers substitute planned operating or capital expenditure with expenditure required to respond to an event, consumers should not pay for the additional costs of responding to an event when overall costs do not increase by the 'incremental' amount. Furthermore, to the extent that the DPP is at least partly reflective of historical expenditure, there may already be provision for associated costs, e.g. of complying with regulations, already implicit in the DPP. Although the full costs of new regulations are unlikely to be captured, in light of how a DPP is set it will not be practicable to determine what amount already are.
- 8.4.18 In addition, although consultation on starting price adjustments is ongoing, the Commission has proposed that upward or downward adjustments to prices would only occur where the supplier's ROI falls outside an ROI 'band'. As noted in Chapter 6, this has been interpreted by some commentators as an effective increase in the regulatory WACC which, in turn, would potentially act as a buffer against cost increases due to a range of factors.
- 8.4.19 Mr Houston of NERA (appearing for Orion) made the following comments at the Input Methodologies Conference in September 2009:

...a necessary feature of a reopener to work is that you have to know ... how prices were set in the world where the reopener did not apply because that becomes your foundational reference point for the change you would need to make when the reopener does apply.... you can have a sort of sweeping reopener ... but then I think almost your reopener is like starting to do a customised price path... in terms of a reopener on a specific component I think you have to have a good grasp of ... what component of the thing you're reopening from was assigned....

So I think the reopener question becomes conditional upon the precision by which the default price path has been established. And of course if the default price path is to be

⁴⁰³ PwC, *Submission to the Commerce Commission Input Methodologies for Electricity Distribution Services Draft Reasons Paper and Associated Draft Determinations (1) Cost Allocation, Regulatory Tax, Pricing Methodologies and Rules and Processes*, 9 August 2010, p. 23, paragraph 75.

⁴⁰⁴ ENA, *Submission 5 Processes and Rules Input Methodology*, 9 August 2010, p. 12, paragraph 55.

something which is in keeping with its spirit, which is to be not a universal customised price path, then that makes reopeners I think more difficult to design, other than having some blanket provision. ... if you have a blanket provision then you've got the problem of really just needing to do the whole job again if that circumstance would ever arise.⁴⁰⁵

8.4.20 The Commission has decided, given that:

- a supplier has the option to apply for a CPP to replace its DPP to address the financial and/or quality implications of significant and unforeseen events;
- the DPP does not have an efficient baseline of forecast expenditure against which to assess the incremental costs of responding to a regulatory change or catastrophic event; and
- the costs of reconsidering price-quality paths would be significant and potentially comparable to the costs of determining CPPs,

the reconsideration provisions for a DPP will not be widened beyond taking account of material errors in determining the price-quality path or reliance on false or misleading information.

8.4.21 The Commission rejects Vector's submission that this approach is inconsistent with the intended operation of the DPP/ CPP framework and the intent of the Act. Part 4 recognises that there is a cost to setting price-quality paths for suppliers - this would also be true of reconsidering either a DPP or a CPP. As highlighted in Chapter 2 and in paragraphs 8.1.10 - 8.1.11, without an underlying assessment of forecast efficient expenditure from which to consider proposed changes (e.g. in expenditure) against, the prices that consumers may face under an adjusted DPP may end up being higher than is appropriate to supply regulated services - which would not be consistent with s 52A(1)(d). In contrast - in the CPP context - the Commission requires provision of information on which it can assess forecast efficient expenditure and, therefore, an appropriate price-quality path. The decision to limit the circumstances in which DPPs can be reconsidered appropriately reflects the differences in approach to setting a DPP and a CPP and is consistent with the intent of the Act.

Treatment of catastrophic events for suppliers subject to a DPP

8.4.22 Catastrophic events are events that:

- are outside the reasonable control of a regulated supplier;
- are unforeseen at the time the price-quality path was determined; and
- in respect of which:
 - action required to rectify its adverse consequences cannot be delayed until a future regulatory period without quality standards being breached;
 - remediation requires either or both of capital expenditure or operating expenditure during the regulatory period; and
 - the full remediation costs are not provided for in the price-quality path.

⁴⁰⁵ Mr Houston on behalf of Orion, Input Methodologies Conference Transcript, pp. 287-288.

- 8.4.23 As discussed above, if a material catastrophic event occurs for a supplier on a DPP, then the appropriate way to deal with that will generally be for the supplier to apply for a CPP that takes account of their particular circumstances. The Commission may also decide to exercise enforcement discretion, as discussed further below.⁴⁰⁶
- 8.4.24 The assessment of expenditure necessary to amend a DPP to take account of a catastrophic event is expected to be comparable to that provided for under the framework for determining a CPP. The consequences of a catastrophic event are likely to be not just the short-term costs of restoring supply; longer-term investment planning is also likely to be required.
- 8.4.25 The Commission's role if a catastrophic event occurs is to provide certainty to a supplier that it can recover the prudent costs of supplying regulated services, including rectifying for catastrophic events, while providing appropriate incentives for suppliers to manage risk, etc. Allowing price increases will not address a potential cash-flow shortfall in the short-term due to catastrophic events, particularly where the shortfall is due to reduced revenues rather than to increased costs.
- 8.4.26 Submitters on the Draft IMs had some valid concerns regarding the use of the CPP process to deal with catastrophic events. For example, how the costs incurred prior to a CPP being determined can be recovered;⁴⁰⁷ the ability for the Commission to prioritise and process in a timely manner proposals where a large number are received in a year;⁴⁰⁸ and that the annual one-week application window for suppliers to make a CPP application may delay the supplier from making a proposal to address a catastrophic event.⁴⁰⁹ The Commission has sought to address these concerns in the IM as described in the following paragraphs.
- 8.4.27 Importantly, it is appropriate to explicitly reflect in the IM that the claw-back provision under s 53V(2)(b) may be applied in response to a catastrophic event to allow for the recovery of prudent additional costs incurred in responding to the event prior to the CPP taking effect. Doing so would provide certainty in the event that suppliers need to obtain financing immediately after a catastrophic event. The IM includes a requirement that CPP applications arising from catastrophic events must be made within 24 months of the event occurring. This would reduce prolonged,

⁴⁰⁶ In the Emerging Views Papers the Commission stated that "If appropriate, the Commission could amend the DPP determination following a catastrophic event under s 52Q, even if no specific re-opening criteria had been set in an input methodology." Orion submitted that "[t]he earthquake is an example of an event that can influence future profitability, and s 52Q together with s 53P(3)(b) provides the Commission with an opportunity to address prices to reflect impacts on both current and future profitability of a supplier." Orion, *Submission on Part 5 of the Revised Draft Determination and Accompanying Input Methodologies Update Paper*, 19 November 2010, pp. 4-5, paragraph 17. As discussed in paragraph 8.4.3 above, the circumstances in which price-quality paths may be reconsidered must be read in light of the reconsideration provisions in the IM. The Commission considers that the CPP is the appropriate mechanism to address any impact of a catastrophic event on a particular supplier's profitability.

⁴⁰⁷ ENA, *Submission 5 Processes and Rules Input Methodology*, 9 August 2010, p. 13, paragraph 59; GasNet, *Input Methodologies (Gas Pipeline Services) Draft Reasons Paper and Draft Determinations*, 9 August 2010, p. 22, paragraph 85; PwC, *Submission to the Commerce Commission Input Methodologies for Electricity Distribution Services Draft Reasons Paper and Associated Draft Determinations (1) Cost Allocation, Regulatory Tax, Pricing Methodologies and Rules and Processes*, 9 August 2010, pp. 25-26, paragraphs 85-86.

⁴⁰⁸ Vector, *Submission in Response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation Regulatory Tax Pricing Methodology Rules and Processes*, 9 August 2010, p. 59, paragraphs 223-224.

⁴⁰⁹ PwC, *Submission to the Commerce Commission Input Methodologies for Electricity Distribution Services Draft Reasons Paper and Associated Draft Determinations (1) Cost Allocation, Regulatory Tax, Pricing Methodologies and Rules and Processes*, 9 August 2010, pp. 25-26, paragraphs 85-86.

unnecessary delays to any subsequent price increases and will increase certainty for consumers, while still allowing sufficient time for suppliers to focus on responding to events first, and submitting CPP applications second. The 24 month timeframe would also take into account the possibility that the 12 month exclusion period for making a CPP proposal prior to a DPP being reset (s 53Q(3)) may be a factor.

- 8.4.28 CPP applications arising as a result of catastrophic events are able to be submitted at any time rather than only during the annual one-week window (aside from the 12 months prior to a DPP being due to be reset as per s 53Q(3)).⁴¹⁰
- 8.4.29 In such circumstances, the Commission would also likely not limit itself to assessing only four applications for a CPP from suppliers of the same type of service (as provided for under s 53Z(1)), so long as it has available resources to do so.
- 8.4.30 In any event, the Commission has discretion whether and, if so, how to enforce breaches of a price-quality path, which it can exercise should a catastrophic event for suppliers under a DPP occur. The Commission intends to publish enforcement guidelines to provide guidance to suppliers, and this is a matter which may be considered as part of this process. The enforcement guidelines are expected to be developed during 2011.

Application of the IM

- 8.4.31 Reconsidering the price-quality path involves making amendments to an existing determination. Amendments will be limited to the extent required to take into account the change in costs arising from the 'event', therefore will not allow for amendments beyond those required to rectify or compensate for the event. Undertaking a broader review of the price-quality path, for example, allowing the whole path to be reconsidered when a qualifying event occurs, is undesirable as it creates uncertainty for suppliers and consumers as to the allocation of risk.
- 8.4.32 Amendments to the price-quality path in response to a reconsideration of the price-quality path will be made by amending the s 52P determination for the relevant supplier for the regulatory year(s) following the year in which the event occurred.
- 8.4.33 In determining the extent of any amendment in response to a catastrophic event, the Commission will take into consideration factors such as:
- the level of risk that is already compensated for in other elements of the price-quality path, such as insurance premiums and any self-insurance provisions;
 - the extent to which any works can be delayed without having a materially adverse effect on quality outcomes; and
 - the extent to which the affected supplier is able to substitute other capex or opex within the period in order to undertake the works (recognising the

⁴¹⁰ The DPP is due to be reset at the end of the regulatory period. Therefore, the current DPP for EDBs is due to be reset on 31 March 2015, which means that CPP applications as a result of a catastrophic event may be made at any time up until 31 March 2014. If a catastrophic event occurs which would ordinarily require a CPP application to be made during the 12 months from 1 April 2014 (were it not for the 12 month exclusion period), then this would be taken into account in the DPP reset, or the CPP application could be submitted after 31 March 2015.

likelihood that some capex and/or opex may need to be deferred to enable the required works to be carried out, due to resource and other constraints).

- 8.4.34 The extent of any amendment in light of a reconsideration will be determined based on recalculations of the relevant building blocks, substituting the revised values as appropriate.
- 8.4.35 Reconsideration of the price-quality path will generally be upon application by a supplier, and the costs of reconsideration will be borne by the supplier. The Commission may also instigate a reconsideration of the price-quality path where it meets the circumstances outlined in paragraphs 8.4.11 - 8.4.12 above.

8.5 Incremental Rolling Incentive Scheme under Part 4

- 8.5.1 As discussed in section 8.1, the Commission has included an IM on an Incremental Rolling Incentive Scheme (IRIS) to apply to opex. This section sets out:
- a. discussion of the rationale for including an IRIS in the IM;
 - b. the key components of the IM;
 - c. why the IRIS is limited to controllable opex; and
 - d. why the IRIS is only applicable to suppliers under a CPP.
- 8.5.2 Further detail on the carryover period and the application of the IRIS is provided in Appendix J3 (paragraphs J3.2 to J3.19).

Rationale

- 8.5.3 Although incentive regulation promotes efficiency improvements, the way in which such price-quality paths operate can create perverse incentives regarding the time at which efficiency gains are made. The standard within-period model for the treatment of efficiency gains allows suppliers to retain any realised efficiency gains for the remainder of the regulatory period. These are then shared with consumers when prices are reset at the end of the regulatory period. This model implies that the length of time the supplier retains the benefit of any efficiency gains decreases as the end of the regulatory period approaches.
- 8.5.4 There is therefore a greater incentive to attain efficiency enhancements in the first year of the regulatory period than there is at any other time (as illustrated in Figure 8.1). In addition, cost reductions that could be potentially attained towards the end of the regulatory period are likely to be postponed until the following regulatory period, as suppliers would be able to benefit from the gains for a longer period before they are shared with consumers at the next price reset.

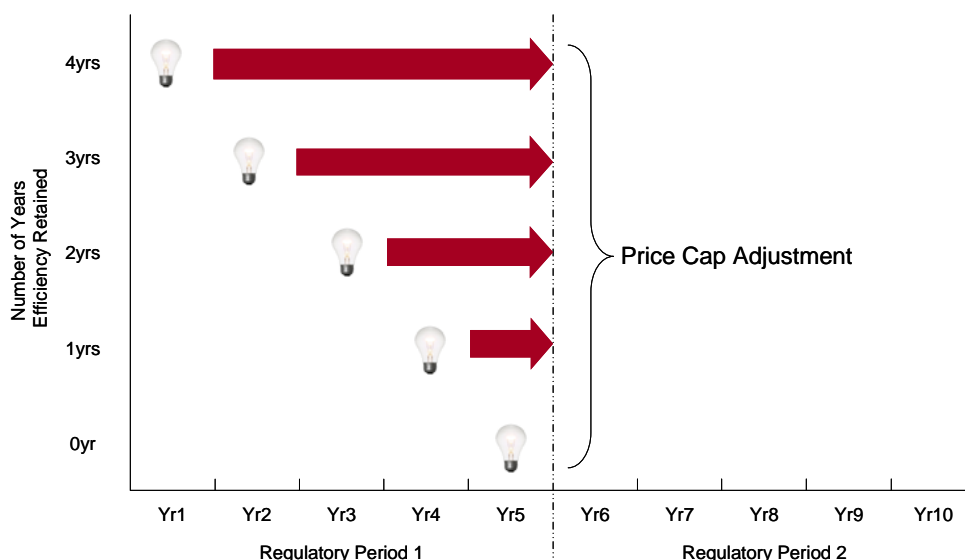


Figure 8.1 Retention of Efficiency Gains under Traditional CPI-X Regulation

8.5.5 A number of overseas regulators have attempted to overcome this attenuation of incentives by using what are known as ‘rolling incentive’ schemes. Rolling incentive schemes specifically address the shortcomings of the within-period model by allowing suppliers to retain the benefits of any efficiency gains for a fixed number of years, irrespective of when they occurred during the regulatory period. As such, a rolling incentive scheme can provide suppliers with equalised incentives to pursue efficiency gains throughout the regulatory period. This type of mechanism is illustrated in Figure 8.2. The diagram below is based on the assumption that suppliers will be allowed to retain gains, or bear losses, for five years before sharing them with consumers.

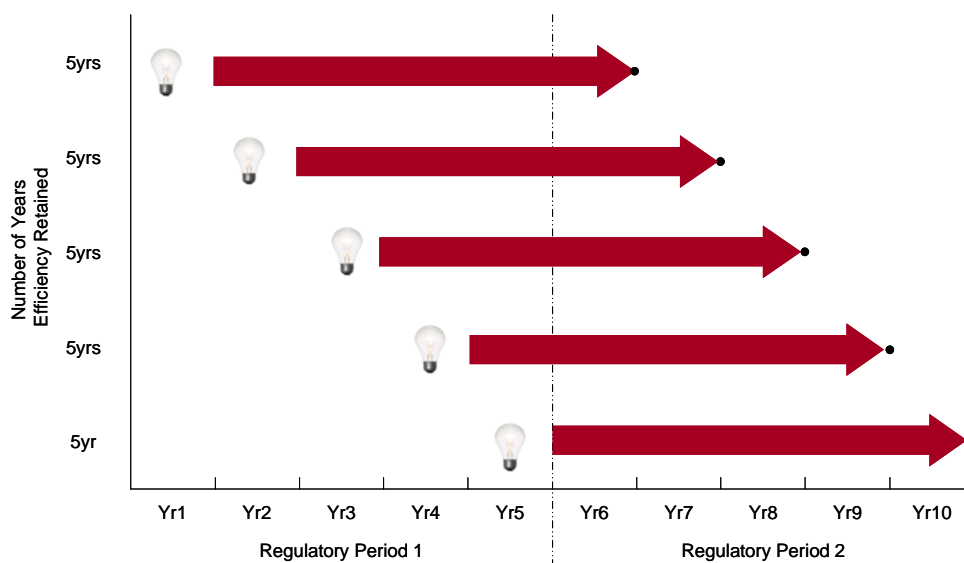


Figure 8.2 Rolling incentive scheme

8.5.6 A rolling incentive scheme is contingent on having reliable cost forecasts for the regulatory period. This is required to make it possible for the regulator to assess and reward the extent of any unforecast efficiency gains achieved by suppliers.

8.5.7 An appropriate IRIS is one that:

- only rewards genuine efficiency gains;
- takes into account both efficiency gains and losses; and
- results in efficiencies being shared with consumers in a reasonable time-frame, while providing suppliers sufficient incentives to pursue efficiencies.

IM for EDBs and GPBs

8.5.8 The efficiency gain or loss for a particular regulatory year will be calculated as the difference between actual and forecast controllable operating expenditure (see paragraph J3.7 in Appendix J3) for the current year, minus the difference in the preceding year, the result of which provides the incremental gain/loss for that year.

8.5.9 While both incremental gains and losses will be carried forward to the subsequent five years, only positive net balances in the next regulatory period of those amounts carried forward will be treated as recoverable costs.

8.5.10 The length of the carryover period (i.e. the length of time suppliers are allowed to retain the efficiency gain before it is shared with consumers) is five years.

8.5.11 Due to the required characteristics for implementing a rolling incentive scheme (discussed in paragraph 8.5.6 above), such a mechanism is not suitable for suppliers under a DPP. However, where a CPP is set, this information is available through forecast information that is used to determine the supplier’s forward looking revenue requirement. Consequently, the IRIS will not be applicable under a DPP but will be applicable under a CPP.

Capex versus opex rolling incentive schemes

- 8.5.12 For capex, any difference between the supplier's actual costs in any given year and the forecast for that year is likely to be due to the supplier's performance in the year in question. While a supplier might find a lower cost way of delivering a capex project in one year, this is unlikely to have much of an effect on the costs of delivering capex projects in subsequent years. It is therefore appropriate to simply assess a supplier's capex performance in each year relative to the forecast for that year.
- 8.5.13 By contrast, opex savings in any given year are more likely to reflect persistent reductions in the supplier's cost base. If a supplier reduces staff numbers in year one of the regulatory period, for example, then opex will likely be lower than forecast not just in that year but in subsequent years too. Similarly, if opex in one year goes up, costs in later years are likely to be higher as well. As a result, when assessing the extent of a gain relative to the forecast, regulators tend to focus their attention on incremental changes in actual opex from one period to another, rather than simply on opex performance in the year relative to the forecast for that year. This ensures that suppliers have an incentive to improve performance year-on-year, while ensuring that past gains or losses are not double counted.
- 8.5.14 However, while there are a number of theoretical attractions with rolling incentive schemes, there are also practical difficulties in achieving these benefits in practice. The main difficulties are that:
- gains or losses are not always within the control of suppliers. Some costs cannot be controlled and others may only be controllable within certain constraints. For example, the ability of suppliers to undertake capex is reliant on the availability of suitable expertise; what appears to be a capex 'saving' may in actual fact be an unavoidable deferral of capex; and
 - gains might not be savings. For one thing, suppliers may choose to defer costs if this could be used to argue for a higher baseline in subsequent years. This issue is more relevant to capex schemes, where expenditure is more easily deferred, which suggests that such a scheme should not be used for this type of expenditure. There is, however, likely to be an incentive for suppliers to reclassify costs if there is a differential treatment of opex and capex. If savings in opex were rewarded differently to savings in capex, for example, then there is a risk that a saving in opex may simply be the result of the expenditure being reclassified by the supplier as capex.
- 8.5.15 The first of these difficulties argues strongly in favour of identifying costs that are within the control of suppliers, and targeting any incentive mechanisms towards these cost categories. The second consideration suggests that schemes that differentiate between opex and capex should recognise that differential treatment of different cost categories can lead to unintended consequences such as cost reclassification.
- 8.5.16 As discussed in paragraph 8.5.5, a rolling incentive scheme is intended to provide equal incentives for suppliers to pursue efficiency gains in each year of the regulatory period and as such, is consistent with the promotion of efficiency (s 52A(1)(b)). At the Electricity Transmission workshop on 2-3 March 2010, participants were asked

whether they had a preference for the ‘within-period’ or rolling incentive scheme.⁴¹¹ All participants supported the rolling incentive scheme. Post-workshop submissions were received from Transpower, Genesis Energy and MEUG, which all supported the rolling incentive scheme approach.⁴¹²

- 8.5.17 While submitters on the Draft Reasons Paper suggested the IRIS should apply to opex and capex,⁴¹³ it is inappropriate for a rolling incentive mechanism to take account of capital expenditure. As highlighted by participants on the gas pipelines day of the Input Methodologies Conference, some overseas regulators experienced significant practical difficulties in applying efficiency mechanisms based on capital expenditure as “it created quite a perverse incentive for companies to defer capex from one period to the next”.⁴¹⁴ To avoid inappropriate categorisation of capex and opex, an independent third-party audit will be required under information disclosure (see paragraph J3.18).
- 8.5.18 The IRIS will therefore only apply to opex. In order to reward only genuine efficiencies, the IRIS should apply to efficiencies in controllable costs only; therefore it is appropriate to exclude certain costs from the IRIS. As such, the IRIS will be based solely on controllable opex.
- 8.5.19 The IRIS recognises incremental out- or under-performance respectively against past performance. The incremental calculation of efficiency gains (i.e. the gains/losses in the current year minus the difference between actual and forecast expenditure in the preceding year) ensures that relative efficiencies are not double counted.

Application by instrument

- 8.5.20 Interested parties have acknowledged throughout the consultation process the difficulties in designing a form of rolling incentive mechanism in the context of the DPP.⁴¹⁵ Some submitters put forward possible rolling incentive mechanisms for the DPP, particularly focusing on the treatment of merger efficiencies.⁴¹⁶
- 8.5.21 In his review of the Draft Reasons Paper, Dr Michael Pollitt noted that it would be desirable to apply a rolling incentive mechanism to a DPP, as the value of such an incentive is not based on the way the price cap is determined, but on its timing-

⁴¹¹ Commerce Commission, Transcript - Transpower Workshop, pp. 29-30.

⁴¹² Genesis Energy Ltd., *Post Workshop Submission*, 24 March 2010, p. 4; MEUG, *Post Workshop Submission*, 24 March 2010, p. 11; Transpower, *Post Workshop Submission*, 24 March 2010, pp. 1-2.

⁴¹³ Vector, *Submission in Response to the Commerce Commission’s Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation Regulatory Tax Pricing Methodology Rules and Processes*, 9 August 2010, pp. 63-64, paragraphs 245(c); Wellington Electricity Limited, *Submission to the Commerce Commission on Draft Input Methodologies Decisions (Electricity Distribution)*, 9 August 2010, p. 12, paragraph 6.2(ii).

⁴¹⁴ Mr Balchin (appearing for Powerco), Input Methodologies Conference Transcript, p. 170.

⁴¹⁵ See for example, Mr Balchin on behalf of Powerco, Input Methodologies Conference Transcript, pp. 167-168, 170-171; Mr Houston on behalf of Orion, Input Methodologies Conference Transcript, pp. 291-292, Powerco post-conference cross-submission, pp. 14-15.

⁴¹⁶ For example: ENA, *Submission 5 Processes and Rules Input Methodology*, 9 August 2010, pp. 21-22, paragraphs 88-91; Unison, *Submission on Commerce Commission Draft Input Methodology Determinations: Regulatory Tax, Cost allocation Pricing Methodologies Rules and Processes*, 9 August 2010, pp. 28-30, paragraphs 96-106; Vector, *Submission to Commerce Commission on Electricity Default Price-Quality Path Discussion Paper*, 17 July 2009, pp. 27-30.

invariant property. Submitters on the Draft Reasons Paper also considered that a rolling incentive mechanism should apply to a DPP.⁴¹⁷

- 8.5.22 As discussed in paragraphs 8.1.10- 8.1.11 above, DPPs are not set from a baseline of assessed forecast efficient expenditure. Therefore, the ability to apply an explicit IRIS by which actual costs are reconciled to forecast information is limited (i.e. the ability of the Commission to identify true efficiency gains is limited due to the practical constraints of how a DPP is intended to operate). However, as previously noted in the Emerging Views Paper, the sharing of the benefits of efficiency gains (including those from mergers and acquisitions) can be taken into account through starting price adjustments at each DPP reset.⁴¹⁸ In light of this—while there would be value in such a scheme if it were feasible—it is not possible to determine a suitable rolling incentive scheme that will apply to the DPP.
- 8.5.23 On the other hand, as a CPP is a customised supplier-specific path determined using a building blocks analysis, a baseline allowance for expenditure suitable for an IRIS can be more readily established. As part of a CPP proposal, suppliers will be requested to identify uncontrollable and controllable costs. The Commission will undertake an assessment of these costs, including the extent to which they are controllable and should qualify for the IRIS, and will determine the quantum that is allowable for IRIS purposes for each year of the regulatory period.

8.6 Treatment of Amalgamations under Part 4

Overview of the IM

- 8.6.1 The primary purpose of the IM covering amalgamations during a regulatory period is to provide certainty to suppliers that the Commission will not reset their prices until the end of the DPP or CPP regulatory period in which the transaction occurs. It is also intended to provide certainty as to when two (or more) price-quality paths should be amalgamated following a transaction.
- 8.6.2 If a supplier amalgamates with another supplier of the same type of regulated service, the Commission will not reconsider the existing price-quality path but will require the suppliers involved in the amalgamation to aggregate price-quality paths for compliance purposes from the start of the disclosure year following the amalgamation (if both regulated suppliers are subject to a DPP) or at the expiry of a CPP (if one or more of the regulated suppliers are subject to a CPP).
- 8.6.3 Where one or more parties to the amalgamation are already subject to a CPP at the time of the amalgamation, a joint CPP may not apply to the amalgamated supplier until the supplier(s) on a CPP have each completed at least three years of their CPP regulatory period (where applicable) by the time the new CPP is to take effect. In

⁴¹⁷ ENA, *Submission 5 Processes and Rules Input Methodology*, 9 August 2010, pp. 20-21, paragraphs 84-87; Genesis Energy Limited, *Input Methodologies – Gas Pipeline Services*, 6 August 2010, p. 6; Powerco, *Submission 1 in Response to Draft Input Methodology and Information Disclosure Determinations*, 9 August 2010, p. 41, paragraph 160; Unison, *Submission on Commerce Commission Draft Input Methodology Determinations: Regulatory Tax, Cost Allocation Pricing Methodologies Rules and Processes*, 9 August 2010, pp. 28-30, paragraphs 96-106; Vector, *Submission in Response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation Regulatory Tax Pricing Methodology Rules and Processes*, 9 August 2010, pp. 64-65, paragraphs 248-252.

⁴¹⁸ Commerce Commission, *Input Methodologies (Electricity Distribution) - Emerging Views Paper*, 23 December 2009, p. 134.

this circumstance, the regulatory period of any existing CPP would be shortened from four or five years to three or four years (terminating on the day before the new CPP will apply). The change would be given effect through an amendment to the existing regulatory period(s) specified in the relevant s 52P determinations. A supplier must complete at least 3 years of its CPP because of the requirement in s 53W(2) that:

the Commission may set a shorter period than 5 years if it considers this would better meet the purpose of this Part, but in any event may not set a term less than 3 years.

Submitters' views

8.6.4 ENA submitted that:

These provisions seems overly narrow and probably unworkable for two reasons; they do not cover all possible circumstances in relation to amalgamations (e.g. the amalgamation of an exempt EDB with a non-exempt is not contemplated), and they do not cover instances other than amalgamations where EDBs may wish to merge their DPPs or CPPs (e.g. where one EDB has purchased one or more other EDBs but does not amalgamate the companies, or where the entities involved are legal entities other than companies, such as a joint venture).⁴¹⁹

8.6.5 Vector, on the other hand, submitted that it:

...agrees with the Commission's decision to reduce the scope of the "transaction" provisions in the original Draft Determinations to only cover "amalgamations".⁴²⁰

8.6.6 The Commission rejects ENA's submission that the IM is unworkable. It is not intended to cover the scenario where an exempt EDB becomes non-exempt as there are provisions in the Act for how this is to be addressed. In such cases, if the relevant s 52P determination does not already include appropriate provisions, the Commission may need to amend the s 52P determination in accordance with s 52Q so that a DPP applies to those services. ENA's suggested drafting also does not cover all circumstances.

8.6.7 ENA also submitted that:

The current DPP Determination provides for merging (in effect) of DPPs under clauses 10.1 – 10.3. While these provisions are useful, they only cover the simple case of merging or demerging of DPPs. Further, as these rules are in a DPP Determination and not in an IM it is not possible for them (due to their scope) to address related issues in other regulatory instruments (such as in a CPP or in information disclosure requirements).⁴²¹

8.6.8 The Commission rejects ENA's assertion that the s 52P determination cannot specify rules applying to CPPs. A CPP for a supplier is imposed by way of an amendment to the s 52P determination relating to default/customised price-quality regulation (s 53V(3)). That s 52P determination applies to both DPPs and CPPs, so the rules in it

⁴¹⁹ ENA, *Submission on Technical Consultation on Parts 1 – 4 of Revised Input Methodologies - From the Electricity Networks Association*, 12 November 2010, p. 14, paragraph 41.

⁴²⁰ Vector, *Submission in response to the Commerce Commission's Revised Draft Determinations and Consultation Update Papers for Electricity Distribution Businesses and Gas Pipeline Businesses*, 12 November 2010, p. 15, paragraph 60.

⁴²¹ ENA, *Submission on Technical Consultation on Parts 1 – 4 of Revised Input Methodologies - From the Electricity Networks Association*, 12 November 2010, p. 16, paragraph 46.

will accommodate both forms of price-quality path, and it may be expressly amended to provide for CPP-only provisions.

- 8.6.9 In general, the compliance formula under a DPP or CPP should be flexible enough to incorporate acquisitions and divestments between regulated suppliers automatically. The Commission intends consulting on appropriate amendments to the compliance formula in the s 52P determination to achieve this once the IMs for EDBs have been set.
- 8.6.10 With regard to the inclusion of related company transactions, the ‘default’ position is more likely to be that suppliers would remain on separate paths than merge their paths, as there would generally still be two regulated suppliers following the transaction. Suppliers that are acting as one regulated supplier could still merge their price-quality paths following a related company transaction as the Commission can determine whether the circumstances of a particular transaction has resulted in one regulated supplier only.
- 8.6.11 Given the range of transactions that fall under related company transactions, rules on this should not be in the IM as the appropriate treatment would be considered in light of the facts of each case. In any event, as a result of a related party transaction, the Commission does not intend reconsidering price-quality terms that have already been set under a DPP or CPP for services that are already subject to a price-quality path until those paths are due to be reset.
- 8.6.12 Vector raised a concern with the requirement for a supplier to have completed three years of its CPP before a joint CPP can apply on the basis of its understanding that the Revised Draft Determination [Clause 3.2.1(6)] “provides that EDBs that amalgamate may not be subject to a CPP until 3 disclosure years have elapsed **since the amalgamation was completed**” [emphasis added].⁴²²
- 8.6.13 The three year period is from the date at which the original CPP *took effect*. Where suppliers amalgamate, they may apply for a CPP well in advance of the three year date so that a new CPP can be determined by the Commission for it to take effect from three years from the date at which the most recent original CPP(s) took effect. Practically speaking, it is unlikely that suppliers will complete an amalgamation just as a CPP is taking effect for one of them; the CPP is expected to already be in effect at the time of the amalgamation. The amalgamated supplier would then need to decide to apply for a CPP; prepare its CPP proposal; and have that proposal considered by the Commission. In the event that a catastrophic event occurs during this period, the IM allows the supplier 24 months to make its proposal and potentially have claw-back apply; the supplier is therefore unlikely to be constrained by the three year limitation when making a CPP application as a result of a catastrophic event. The requirement that suppliers must always complete three years of a CPP from the time it takes effect should not prevent CPPs being available to amalgamated suppliers in a timely way.

⁴²² Vector, *Submission in response to the Commerce Commission’s Revised Draft Determinations and Consultation Update Papers for Electricity Distribution Businesses and Gas Pipeline Businesses*, 12 November 2010, p. 15, paragraph 61.

CHAPTER 9: CPP REQUIREMENTS

9.1 Introduction

9.1.1 Section 53Q(1) provides that at any time after a DPP is set by the Commission, a supplier that is (or is likely to be) subject to a DPP may make a proposal to the Commission for a CPP to apply to that supplier.

9.1.2 Every proposal for a CPP must (s 53Q(2)):

- a. comply with the IMs referred to in s 52T(1)(d) relating to the process for, and content of, customised price-quality path proposals; and
- b. be made within the period, or by the annual date, specified for the purpose in the s 52P determination; and
- c. include the standard application fee for CPP proposals;⁴²³ and
- d. apply or adopt all relevant IMs.

9.1.3 Section 52T(1)(d) requires that IMs relating to particular goods or services must include, to the extent applicable to the type of regulation under consideration:

matters relating to proposals by a regulated supplier for a customised price-quality path, including—

- (i) requirements that must be met by the regulated supplier, including the scope and specificity of information required, the extent of independent verification and audit, and the extent of consultation and agreement with consumers; and
- (ii) the criteria that the Commission will use to evaluate any proposal.

9.1.4 The IMs discussed in earlier chapters of this Paper are also relevant to CPPs. Those IMs:

- underpin the determination of revenue for a CPP (i.e. asset valuation, tax, cost allocation, the cost of capital and aspects of the specification of price that pertain to the determination of revenue);
- set out the approach to setting prices under a CPP (i.e. pricing methodologies for GPBs); and
- specify rules and processes for how a CPP operates once it has been determined (i.e. reconsideration of a CPP, treatment of amalgamations, and aspects of the specification of price that pertain to pass-through costs, recoverable costs and IRIS).

9.1.5 This chapter focuses on IMs for determining a CPP under s 53V and the matters listed in s 52T(1)(d).

⁴²³ In accordance with section 53Q(2)(c), every proposal must include the standard application fee for customised price-quality path proposals. The Commission will set the standard application fee in 2011.

Application of the IMs for CPPs

- 9.1.6 Except where indicated otherwise, the IMs discussed in this chapter apply to non-exempt EDBs and to all GPBs. Accordingly, references to EDBs in this chapter should be construed as referring to non-exempt EDBs only.
- 9.1.7 The Commission may determine any CPP that it considers appropriate (s 53V(1)). However, it must set a CPP that complies with s 53M (which contains the generic provisions applicable to a price-quality path) and, in the absence of any agreed variation to an applicable IM under s 53V(2)(c), it must apply all applicable IMs in determining a CPP (s 52S). A CPP is imposed by way of an amendment to the s 52P determination relating to the default/customised price-quality regulation applying to the supplier (s 53V(3)). A supplier's proposal must comply with, apply, or adopt all relevant IMs (s 53Q(2)).
- 9.1.8 This chapter explains the key features of these IMs.

Structure of this chapter

- 9.1.9 The remainder of this chapter is structured as follows:
- Section 9.2 provides an overview of the Commission's approach to setting the CPP requirements;
 - Section 9.3 describes the analytical approach to determining a CPP (with further detail provided in Appendix K2);
 - Section 9.4 discusses the criteria for the Commission's evaluation of a CPP proposal;
 - Section 9.5 discusses the assessment of forecast expenditure under a CPP and the opex/capex information requirements to be met by a supplier (with further detail provided in Appendix K3); and
 - Section 9.6 describes the consumer consultation, audit, verification and certification requirements to be met by a supplier making a CPP proposal (with further detail on verification provided in Appendix K4).
- 9.1.10 In addition, Appendix K1 discusses the process of applying for a CPP. This includes the treatment of proposals that may be deferred following the Commission's exercise of its prioritisation powers (for EDBs only) and the recovery of the costs of applying for a CPP.

9.2 Key Considerations in Setting the CPP Requirements

- 9.2.1 The purpose of default/customised price-quality regulation is set out in s 53K, which provides:

The purpose of default/customised price-quality regulation is to provide a relatively low-cost way of setting price-quality paths for suppliers of regulated goods or services, while allowing the opportunity for individual regulated suppliers to have alternative price-quality paths that better meet their particular circumstances.

- 9.2.2 As is discussed in Chapter 2, determining a CPP is likely to be more costly than determining a DPP. Additional costs arise from:
- each individual supplier preparing, verifying and consulting on its CPP proposal, which will include information to justify a path that better meets its particular circumstances;
 - the Commission's evaluation of that proposal; and
 - the Commission's subsequent setting of the CPP for the supplier.
- 9.2.3 The Commission considers that use of building blocks analysis is necessary to determine a CPP tailored to the supplier's particular circumstances. Unlike a DPP, CPPs are designed to better meet the particular circumstances of the supplier so there is a greater emphasis on supplier-specific costs.⁴²⁴ The information to be provided as part of a CPP proposal must therefore be sufficient to support this analysis.
- 9.2.4 During consultation, suppliers and their representatives have expressed concerns regarding the costs associated with making a CPP proposal, should they elect to do so.⁴²⁵ The Commission is mindful of the need to minimise the costs of regulation, while still promoting the Part 4 Purpose. Therefore, it has sought to develop a cost-effective approach to preparing, verifying and evaluating CPP proposals.
- 9.2.5 A cost-effective approach is promoted by the Commission by:
- building upon information that is, or is expected to be, required under information disclosure (under subpart 4 of Part 4 of the Act);
 - targeting the provision of more detailed information on proposed expenditure to that which is expected to be material to the proposal;
 - with the exception of certain verification and audit requirements, only requiring information on proposed expenditure that is consistent with the level of detail that would be expected to already be held in a well-run and well-governed business;
 - recognising that, for the first five years of the new regime, there is a need for transitional provisions for how a supplier provides its historical expenditure information in a CPP proposal;
 - focusing on obtaining information that is expected to be required to assess all CPP proposals, and not requiring suppliers to include information on things

⁴²⁴ The exception is where a quality standard variation is proposed by an EDB, in which case a lesser set of information is required. This is discussed in Section 9.3 and Appendix K2.

⁴²⁵ For example, *Opex/Capex for CPP Proposals Workshop Transcript*, 30 March 2010 (Mr Gray for Maui Development Limited, lines 3-8, p. 39, Ms Taylor for PwC (on behalf of 21 EDBs), lines 14-21, p. 39, and Ms Reid for Unison, lines 5-8, p. 48); Electricity Networks Association, *Post Workshop Submission on Customised Price-Quality Path Capex/Opex Information Requirements*, 19 April 2010, p. 1; Wellington Electricity Lines Limited, *Post-Workshop Submission on Customised Price-Quality Path*, 19 April 2010, pp. 4-5; Nelson Electricity Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 2, paragraph 4; Unison Networks Ltd, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 2, paragraph 7.

such as possible incentive, innovation, or quality mechanisms (i.e. s 53M(2));⁴²⁶

- only requiring a GPB to include a pricing methodology in its proposal where the Commission has assessed (under information disclosure) that this is necessary;
- providing for a variation to the existing DPP quality standards for EDBs only, which recognises that not all suppliers may seek to increase their prices under a CPP, in which case only information relating to the proposed ‘quality standard variation’ needs to be included in the CPP proposal;
- allowing some flexibility in how the applicant engages with its consumers prior to the proposal being submitted. This recognises that consumer consultation can be costly and that the appropriate and targeted engagement strategy will depend on the characteristics of the supplier’s own consumer base as well as the reasons for the proposal;
- including audit and verification requirements only where audit and verification will add value to the assessment process;
- not requiring information that has already been audited to be re-audited; and
- limiting pre-submission verification to key parts of the proposal, in order to lower verification costs.

9.2.6 The Commission found the ENA’s submission on the CPP aspect of the Draft Determinations⁴²⁷ particularly helpful in refining its draft decisions and has adopted many of its suggestions.⁴²⁸ The Commission notes that the ENA’s submission was supportive of many aspects of the CPP requirements (e.g. the general approach to the expenditure information requirements, consumer consultation, and audit and verification) but raised concerns about other aspects (e.g. the evaluation criteria, some of the detail in the expenditure requirements). Vector submitted that requirements for suppliers should provide sufficient flexibility so they are not precluded from putting forward a reasonable proposal that would benefit consumers in the long term.⁴²⁹

9.2.7 The Commission has had regard to all submitters’ concerns in developing its requirements. The Commission considers that its approach for CPPs has struck a reasonable balance between cost-effectiveness and having sufficient information available to the Commission to determine an appropriate CPP under s 53V in the first instance, recognising that the Commission can always request further information

⁴²⁶ Where it is relevant to such a proposal, suppliers are not precluded from including this information in their proposal.

⁴²⁷ Electricity Networks Association, Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements, 23 August 2010.

⁴²⁸ These matters were set out in the technical consultation papers released on 22 October 2010 (see Commerce Commission, *Input Methodologies (Electricity Distribution Services) Consultation Update Paper*, October 2010; and Commerce Commission, *Revised Draft Commerce Act (Electricity Distribution Services) Input Methodologies Determination 2010*, 22 October 2010) and are not repeated in this Paper.

⁴²⁹ Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 21, paragraph 72.

from a supplier, if necessary, after the proposal has been submitted (s 53S(2)(b) and s 53ZD). The Commission also considers that its approach to evaluating a CPP proposal and determining a CPP effectively balance the promotion of certainty with the need for flexibility for both suppliers and the Commission.

- 9.2.8 The Commission also notes that some suppliers support a review of the CPP requirements once the Commission has processed the first CPP applications.⁴³⁰ The Commission supports the suggestion of an early review of the CPP IMs in principle, as it has been a challenge to set CPP requirements prior to their first practical application. There will likely be a need for refinements to the requirements as experience with the CPP process grows. As the Act provides for a review of IMs at any time under s 52Y (but no later than seven years after they are set), the Commission does not consider that a requirement to this effect is necessary in the IM itself.

9.3 Key Steps in Determining a CPP

Summary of key steps

- 9.3.1 The approach to determining a CPP involves five key steps:

- i. the calculation of Building Blocks Allowable Revenues (BBAR);
- ii. transformation of the BBAR into a smoothed present value-equivalent revenue path to determine the P_0/X (the Maximum Allowable Revenues (MAR));
- iii. transformation of the MAR into a weighted average price cap or into a revenue cap, consistent with the specification of price IM;
- iv. setting appropriate quality standards, commensurate with the MAR; and
- v. **for GPBs only:** assessment and determination of the pricing methodology (if relevant to the applicant).

- 9.3.2 As a CPP applies for 5 years (s 53W(1)) unless a supplier justifies a shorter period, information submitted in a proposal will be required to cover the period from the disclosure year in which an application is made until the end of a 5 year regulatory period. Therefore, the information necessary to undertake the CPP analysis is required to cover a period of 7 years (assuming that a two year assessment period applies).⁴³¹

- 9.3.3 Steps 1-4 are discussed in more detail in Appendix K2. The remainder of this section provides a brief overview of each step.

⁴³⁰ Unison Networks Ltd, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 4, paragraph 16; Vector Limited, *Cross Submission on Input Methodologies Draft Reasons Paper*, 3 September 2010, p. 13, paragraph 43.

⁴³¹ The assessment period is the period between the end of the most recent disclosure year (prior to the submission of the CPP application) and the supplier's anticipated commencement date of the CPP. This assumes that reasonable time is allotted to the Commission to undertake its assessment of the CPP application in accordance with ss 53S, 53T and 53U.

Step 1: Calculation of Building Blocks Allowable Revenue

9.3.4 Consistent with the general approach to building blocks analysis, introduced in Chapter 2, the allowable revenue for each year of a CPP regulatory period is determined by calculating the following ‘building blocks’:⁴³²

$$\begin{aligned} & \text{the return on capital (forecast Regulatory Investment Value}^{433} \times \text{WACC + term} \\ & \text{credit spread differential allowance - forecast revaluation gains)} \\ & + \text{the return of capital (forecast depreciation)} \\ & + \text{forecast regulatory tax allowance} \\ & + \text{forecast opex} \\ & - \text{forecast other regulated income} \\ & = \text{BBAR} \end{aligned}$$

9.3.5 With the exception of circumstances in which the price-quality path is reconsidered during a regulatory period (discussed in Chapter 8), the BBAR is set *ex ante* and not adjusted to take account of actual costs during the regulatory period. This provides incentives for a supplier to out-perform the forecast during that period.

9.3.6 ENA and Vector submitted that ‘pass-through costs’ and ‘recoverable costs’ should be included in BBAR.⁴³⁴ Pass-through costs and recoverable costs are difficult to forecast because they are largely outside the control of the supplier. This is why they are excluded from the calculation of BBAR.⁴³⁵ The IM Determinations provide for these costs to be recovered in addition to BBAR because compliance with the CPP is determined after pass-through costs and recoverable costs are netted off prices (see Chapter 8).

9.3.7 The methodologies to calculate or estimate the first three variables in the above formula were set out in Chapters 3 - 6 of this paper (as they relate to information disclosure also).

9.3.8 The variables in the revenue calculation that are not fully discussed in earlier chapters are:

⁴³² The full specification of the building blocks formula is dependent on the tax approach used (as set out in the IM Determinations). Further discussion on differences in the formula(e) for each type of regulated service is provided in Appendix K2.

⁴³³ Regulatory Investment Value (RIV) for a disclosure year is the total opening RAB value *plus* opening deferred tax *plus* proportionate capital additions *less* proportionate asset disposals (for that disclosure year).

⁴³⁴ Electricity Networks Association, *Mark-ups on EDBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, p. 62, clause 5.4.2 (mark-up); Vector Limited, *Submission on EDBs and GPBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, p. 11, paragraph 42; Vector Limited, *Mark-ups on EDBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, p. 61, clause 5.4.2 (mark-up).

⁴³⁵ The definition of ‘forecast operating expenditure’ (which is a component of BBAR) explicitly excludes pass-through costs and recoverable costs.

- forecast capex (which enters the RAB through the ‘roll forward’ formula)⁴³⁶ and forecast opex; and
- forecast other regulated income.

9.3.9 Forecasts of opex and capex (after being transformed into a commissioned asset value) must be consistent with a cost allocation already carried out. Further details on the rules for allocating costs (and when these allocations should be carried out) for the purpose of CPP proposals is set out in Chapter 3 and Appendix B.

Forecast expenditure

9.3.10 The assessment of opex and capex forecasts will be an important part of CPP determinations. Opex allowed during the regulatory period has a particularly material effect on prices, typically making up about 30% of regulated revenues. Capex affects revenue, once the assets associated with the capex are commissioned and have entered the RAB, through the return on capital and the depreciation building blocks. The effect of capex on revenue will depend on the proportion of new capex relative to the existing RAB (which is depreciating) and the type of capex being undertaken. Capex in respect of non-system fixed assets has a relatively greater effect on prices due to its higher depreciation rates.

9.3.11 When setting a DPP, there is likely to be a limit to the extent to which supplier-specific circumstances, rather than industry-wide circumstances, can be taken into account (given the constraints in s 53P (see Chapter 2)). As a result, step changes in future expenditure for a particular supplier relative to its historical expenditure is expected to be a key reason for CPP applications being made. This is also reflected in the criteria to be used by the Commission in exercising its prioritisation powers (s 53Z(3)(b)).

9.3.12 The approach to assessing forecast expenditure is discussed further in Section 9.5. The requirements to be met by a regulated supplier are discussed in Section 9.5 and Appendix K3.

Forecast other regulated income

9.3.13 Suppliers receive most of their regulated revenue through standard line / pipeline charges. They also receive income associated with the provision of regulated services that is charged for in other ways (i.e. other regulated income). Where the costs of providing these services are allowed for in the BBAR calculation, it is necessary to deduct ‘other regulated income’ from the calculation of revenue that can be recovered through standard charges, to prevent the supplier from recovering its costs twice.⁴³⁷

⁴³⁶ The key components of the RAB are described in Chapter 4 on asset valuation. Capex forms part of the RAB calculation. How and when capex is added to the RAB is discussed in Chapter 4 and Appendix E. Under IMs for information disclosure no assessment of capex to determine how much capex can be added to the RAB is undertaken by the Commission. As the assessment of forecast capex is only applicable to a CPP, it is discussed in detail in this chapter.

⁴³⁷ The main form of other regulated income for EDBs and GPBs is capital contributions, however, this income is netted off the value of the RAB rather than treated as income in the BBAR calculation. This is discussed in Chapter 4.

Requirements for the supplier - BBAR calculation

- 9.3.14 A CPP applicant must include annual amounts (specified in nominal terms) for its proposed BBAR for the assessment period and the regulatory period. As expenditure (capex in particular) varies year-on-year, the profile of BBAR during the regulatory period may be ‘lumpy’.
- 9.3.15 The applicant is expected to provide all data, information, calculations and assumptions used to calculate the revenue. This will enable the Commission to test the CPP proposal’s consistency with the IMs that underpin the calculation of forecast revenue (in other words, whether the applicant has applied the IMs correctly in preparing its proposal).⁴³⁸

Step 2: Transformation of Building Blocks Allowable Revenue into Maximum Allowable Revenue

- 9.3.16 Once the BBAR has been derived, the next step is to determine the series of values of MARs, which is equivalent in net present value (NPV) terms (i.e. NPV-equivalent) to the series of BBARs over the period.⁴³⁹ The determination of MAR provides a smoothed revenue profile so that prices to consumers do not fluctuate significantly between years of the CPP regulatory period. For each ‘X factor’ (or rate of change) applying to the CPP regulatory period there will be a corresponding ‘P₀’ (or starting price adjustment)⁴⁴⁰ at the start of the regulatory period that makes the MAR and BBAR NPV-equivalent.
- 9.3.17 There are multiple combinations of P₀/X that will result in a series of values of MARs over the regulatory period that are NPV-equivalent to the series of BBARs over the same period. The default position adopted by the Commission under IMs is that the X factor applicable to DPPs applies to CPPs also. The reason is that the DPP X factor is based on industry-wide productivity analysis,⁴⁴¹ and unless the supplier applies for another CPP it will transition to a DPP at the end of its CPP. However, the appropriate balance between P₀/X will be situation-specific and depend, among other things, upon the cash flow needs of the CPP applicant and the extent of possible price-shocks to its consumers.
- 9.3.18 Suppliers will propose the P₀/X combination that they consider best fits their circumstances and this will be evaluated by the Commission in light of the Part 4 Purpose. The Commission may either accept the supplier’s proposal, or determine an alternative P₀/X combination, which may involve taking account of claw-back under s 53V(2)(b), should claw-back apply.⁴⁴²

⁴³⁸ The Commission expects to develop a revenue model template that is consistent with the IMs, which a supplier can use in preparing its proposal. The spreadsheet model will not be part of the IM and will be provided as guidance on the level of detail and functionality expected in a supplier’s proposal, rather than a mandatory requirement.

⁴³⁹ Strictly speaking, it is MAR after tax that is to be NPV equivalent to BBAR after tax, rather than equivalence on a before tax basis. Normally the distinction will be of no effect, but where tax losses arise the distinction becomes relevant and the NPV equivalence must be established on an after tax basis. Footnote 108 on p. 44 above explains the meaning of ‘present value’.

⁴⁴⁰ The term ‘price adjustment’ is equivalent to ‘revenue adjustment’.

⁴⁴¹ Although the Commission may set alternative X factor(s) for a particular supplier in certain circumstances (s 53P(8)).

⁴⁴² As discussed in Appendix K1, claw-back may be allowed where a proposal results from a catastrophic event from deferral of an EDB’s CPP proposal.

- 9.3.19 In its proposal, a supplier must clearly demonstrate how MAR in each year of the CPP regulatory period has been derived from BBAR and all data and calculations must be presented in spreadsheet format.

Step 3: Transformation of Maximum Allowable Revenue into a weighted average price cap or revenue cap

- 9.3.20 The transformation of the MAR into either a weighted average price cap or into a revenue cap, depending on the specification of price IM for the service in question, will be given effect to by the Commission once it has determined the MAR for the CPP regulatory period and the compliance requirements for a CPP under s 53N.⁴⁴³
- 9.3.21 If a supplier proposes additional costs to be passed through to consumers than those listed in the IM then these must also be assessed against the criteria for assessing pass-through costs in the specification of price IM.⁴⁴⁴
- 9.3.22 Unless the pricing methodology IM is deemed to be relevant to the CPP applicant, the supplier will have the flexibility of setting its own prices subject to that cap.

Step 4: Setting appropriate quality standards

- 9.3.23 Under s 53M(3) of the Act, in determining a CPP, quality standards may be prescribed in any way the Commission considers appropriate.⁴⁴⁵ The quality standards requirement in default/customised price-quality regulation is intended to ensure that when responding to the cost-reducing incentives provided by the price path, regulated suppliers do not lower service quality below the level that is demanded by consumers, consistent with s 52A(1)(b).⁴⁴⁶
- 9.3.24 To the extent that the quality standards prescribed under a DPP reflect the quality levels demanded in aggregate by the consumers receiving the service, consumers should not generally receive a lower standard of quality as a result of the supplier being on a CPP.
- 9.3.25 Under the initial reset DPP for EDBs, which applies from 2010-2015, the quality standards use reliability limits based on the historic averages of SAIDI and SAIFI reliability data for the period 2005-2009.⁴⁴⁷
- 9.3.26 In relation to EDBs, the Commission will assume that the DPP quality standards are appropriate to be applied in a CPP unless:

⁴⁴³ For instance, the Commission's Decision No. 685 (30 November 2009) comprises both the s 52P determination provisions and the s 53N compliance monitoring provisions in respect of DPPs for EDBs. CPPs are imposed by way of an amendment to the relevant s 52P determination (s 53V(3)).

⁴⁴⁴ See Chapter 8.

⁴⁴⁵ Standards may be targets, bands, or formulae and may include (without limitation) responsiveness to consumers and, in relation to electricity lines services, reliability of supply, reduction in energy losses, and voltage stability or other technical requirements (s 53M(3)).

⁴⁴⁶ See Chapter 2.

⁴⁴⁷ System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) measure the reliability of the network. SAIDI measures interruption duration and is calculated as the average outage duration for each customer in units of time (usually minutes per year). SAIFI measures interruption frequency and is calculated as the average number of interruptions that a customer would experience over a year.

- a supplier proposes a variation to the existing DPP quality standards, which results, for example in the case of EDBs, in a different number of SAIDI minutes;⁴⁴⁸ or
- a supplier proposes that the quality standards under a DPP need to be relaxed during the CPP regulatory period to allow the applicant to carry out proposed investments in its regulated assets;⁴⁴⁹ or
- having undertaken its own assessment as to whether the DPP quality standards are commensurate with the proposed price path, the Commission determines that higher, lower or additional quality standards should apply under a CPP, in accordance with s 53M(3).

9.3.27 The first two bullet points are referred to in the EDBs IM Determination as a ‘quality standard variation’ in the section dealing with information required in a CPP proposal. The extent of the quality standard variation that may be proposed is limited to providing a changed representation of the underlying quality of service in respect of the prescribed metric or metrics. This is because the Commission considers that reliability of the network is an important aspect of quality demanded by consumers, which should be included in quality standards for all EDBs subject to either a DPP or a CPP.⁴⁵⁰ A quality standard variation might be proposed without variation to the price path, in which case only information relating to quality would need to be included in the CPP proposal; or as an explicit price-quality trade-off (e.g. lower price path, with lower quality).

9.3.28 If an EDB does not propose a quality standard variation, no information on quality (other than that on service categories, measures and levels necessary for assessing proposed expenditure allowances) will be required in the proposal. Further detail on the information requirements where a quality standard variation is proposed are discussed in Appendix K2.

9.3.29 In undertaking its assessment of a quality standard variation proposed by an EDB, the Commission will apply the evaluation criterion of: the extent to which any

⁴⁴⁸ This may arise because the historic data, on which the DPP reliability limits are based, is not representative of future performance over the forthcoming CPP regulatory period.

⁴⁴⁹ As an example, PwC noted in submissions on the DPP determination that major outstanding investments planned by some EDBs to improve long-term reliability may result in a temporary reduction in reliability.⁴⁴⁹ PriceWaterhouse Coopers on behalf of 21 EDBs, *Submission to the Commerce Commission on the Reset of Default Price-Quality Path for Electricity Distribution Businesses Discussion Paper*, 17 July 2009, response to Q 62, p. 35. Such reductions in reliability might occur, for example, as a result of a need for planned outages and a heightened risk of unplanned outages during the investment period.

⁴⁵⁰ Although Vector submitted that “the Commission should not prescribe fixed quality standards as part of a CPP. Rather, suppliers should be able to propose quality standards (and associated metrics) that best reflect their business requirements over the CPP regulatory period” it also submitted that “SAIDI and SAIFI proposed for EDBs seem reasonable”. Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, pp. 48-49, paragraphs 186-187. The ENA submitted that “[i]n addition it is proposed that a supplier may apply an alternative specification of quality standards to apply under a CPP, i.e.: measures of quality which are different to the SAIDI and SAIFI reliability limits in the DPP. The ENA also supports this proposal as it allows EDBs to consider particular solutions which may be more relevant for some consumers, some parts of the network or in response to certain behaviours.” Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 71-72, paragraph 284. The Commission clarifies that this was not the proposal in the Draft Determination and Companion Paper; the Commission’s view is that reliability limits are a fundamental aspect of regulating quality for EDBs and should apply in all cases unless a variation to the IM under s 53V(2)(c) is agreed.

proposed quality standard variation better reflects the realistically achievable performance of the EDB over the CPP regulatory period taking into account statistical analysis of past SAIDI and SAIFI performance and/or the level of investment provided for in proposed maximum allowable revenue before tax (as applicable). This criterion recognises that there may be circumstances in which the historic time series of service quality data prescribed in a DPP determination is unrepresentative of the realistically achievable performance of the EDB over the CPP regulatory period.

- 9.3.30 Until the DPPs are set for GPBs, it is not practicable to determine the appropriate approach to quality under CPPs for GPBs. The Commission therefore intends to review the provisions in the GPBs' IMs relating to quality for CPPs as a result of consulting on the first DPP for GPBs.
- 9.3.31 Under s 53M(2) of the Act, a price-quality path may include different incentives for an individual supplier to maintain or improve its quality of supply. Suppliers are not expected to include information on possible incentive mechanisms unless these are directly relevant to the supplier's proposal. Given the range of possible proposals, the Commission has not prescribed information requirements for this. However, an applicant is expected to provide sufficient information to allow the Commission to undertake its assessment.

GPBs only: Step 5: Assessment of pricing methodology

- 9.3.32 As discussed in Chapter 7, a GPB will be required to submit a pricing methodology as part of its CPP proposal if it has been identified through the most recent information disclosure summary and analysis as being required to do so, were it to apply for a CPP. Should this happen, the Commission will determine a pricing methodology that is consistent with the pricing principles in the IM (or that transitions to consistency with the principles) as part of a CPP determination.

9.4 Commission's Evaluation of a CPP Proposal

- 9.4.1 Section 52T(1)(d)(ii) requires the Commission to include the criteria it will use to evaluate CPP proposals as an IM. The IM provides that the Commission will assess CPP proposals using the following evaluation criteria:
- a. Whether the proposal is consistent with the relevant IMs.
 - b. The extent to which the CPP, in accordance with the proposal, will promote the Part 4 Purpose.
 - c. Whether data, analysis, and assumptions underpinning the proposal are fit for the purpose of the Commission determining a CPP under s 53V.
 - d. Whether proposed capex and opex reflects the efficient costs that a prudent regulated supplier would require to:
 - i. meet or manage the expected demand for the relevant services, at appropriate service standards, during the forthcoming CPP regulatory period and over the longer term; and

- ii. comply with applicable regulatory obligations associated with the services.
- e. **EDBs only:** The extent to which any proposed quality standard variation better reflects the realistically achievable performance of the EDB over the CPP regulatory period taking into account statistical analysis of past SAIDI and SAIFI performance and/or the level of investment provided for in proposed maximum allowable revenue before tax (as applicable).
- f. The extent to which:
 - i. the supplier has consulted with consumers on its proposal; and
 - ii. the proposal is supported by consumers, where relevant.

9.4.2 Under s 53V, the Commission may determine any CPP that it considers appropriate for a supplier that has made a proposal. The scope of this power is broad in the sense that, as clarified under subsection (2) of that section, the Commission may set a price-quality path that is lower or otherwise less favourable to the regulated supplier than a DPP; or, it may set a higher price than applied under a DPP. However, it is restricted in that:

- it must set a CPP that complies with s 53M (which contains the generic provisions applicable to a price-quality path); and
- in the absence of any agreed variation to an applicable IM under s 53V(2)(c), it must use all applicable IMs.

9.4.3 The remainder of this section:

- explains each component of the evaluation criteria; and
- discusses other suggestions for the evaluation criteria put forward by submitters.

Criterion a: Consistency with relevant IMs

9.4.4 The Commission's starting point for evaluating any CPP proposal is the Part 4 Purpose and the IMs that underpin the CPP determination have been set in light of this. Therefore, in the first instance, the Commission must assess whether a proposal is consistent with the IMs. The inclusion of this criterion was supported by ENA and Vector.⁴⁵¹

Criterion b: Promotion of the Part 4 Purpose

9.4.5 The Commission will need to assess the extent to which the CPP, in accordance with the supplier's proposal, will promote the Part 4 Purpose. This criterion is particularly relevant where there is flexibility in the IMs (e.g. an alternative depreciation approach under CPPs). Where a supplier includes (as part of its proposal) matters not explicitly provided for in IMs (e.g. incentives to maintain or improve its quality

⁴⁵¹ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 23, paragraph 89; Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 17, paragraph 55.

of supply under s 53M(2)), the Commission intends to assess those matters using this criterion, along with criterion (c) below.

- 9.4.6 Several submitters considered that proposals should be assessed relative to the DPP applying to that supplier.⁴⁵² The Commission will assess each proposal on its merits using the evaluation criteria and not against any alternatives (including the DPP applying to the supplier).
- 9.4.7 Submitters also considered that the evaluation criteria should be supplemented with additional requirements to restrict the Commission's discretion in determining an alternative CPP to the one proposed by the supplier, in order to promote certainty.⁴⁵³ However, s 53V provides the Commission with the discretion to determine any CPP that it considers appropriate (subject to the restrictions outlined above). Nevertheless, given the time and information constraints on the Commission, in practice, any alternative CPP determined by the Commission is likely to be by way of an amendment to a supplier's proposal, rather than by substitution of the entire proposal.

Criterion c: Fit for purpose

- 9.4.8 The information in a proposal must be sufficient in detail and quality to allow the Commission to undertake its assessment. This is the basis for the inclusion of this criterion and it was generally supported by ENA.⁴⁵⁴
- 9.4.9 It was also supported by Vector. However, Vector considered that the Commission should clarify that 'fit for purpose' means no more than satisfying the IM data requirements specified by the Commission.⁴⁵⁵ The Commission considers that this clarification would not achieve the intended purpose, which is not just to ensure that the information is provided, but that the Commission is able to rely on that information.

⁴⁵² Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 24-25, paragraphs 93-94; PricewaterhouseCoopers on behalf of 20 EDBs, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 9, paragraph 17; Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 7, paragraph 18; GasNet Limited, *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper*, 9 August 2010, p. 23, paragraph 89; Wellington Electricity Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 18.

⁴⁵³ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010 pp. 24-26, paragraphs 92-97; Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 7, paragraphs 18-19; GasNet Limited, *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper*, 9 August 2010, p. 23, paragraphs 89-90; Wellington Electricity Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 18-19; PricewaterhouseCoopers on behalf of 20 EDBs, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 8-10, paragraphs 16-20; Unison Networks Ltd, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, paragraph 8(c); Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 10, paragraph 30 & pp. 18-19, paragraphs 58-60.

⁴⁵⁴ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 26, paragraphs 98-99.

⁴⁵⁵ Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 2, paragraphs 77-78.

Criterion d: Expenditure Objective

- 9.4.10 The assessment of forecast expenditure is not amenable to being a mechanistic process and necessarily involves the exercise of judgement. To promote certainty for suppliers and consumers as to how the Commission will assess the expenditure forecasts provided in a CPP proposal, the Commission has incorporated a specific evaluation criterion for the assessment of opex and capex, in addition to the general evaluation criteria. It was developed on the basis of advice from Farrier Swier Consulting (Farrier Swier) and UK and Australian experience.⁴⁵⁶
- 9.4.11 Submitters were generally supportive of the opex/capex evaluation criterion in consultation,⁴⁵⁷ although some concerns were raised in respect of how it might be applied in practice and more precise definitions of certain terms (e.g. ‘prudent’ and ‘expected demand’) were sought.⁴⁵⁸ The Commission considers that the criterion should be set at a level that provides sufficient flexibility to deal with the supplier’s particular circumstances, consistent with s 53K. The Commission’s advisor, Strata, also considered that the expenditure objective was set at the appropriate level.⁴⁵⁹
- 9.4.12 ENA and PwC considered that there should be explicit recognition of the potential trade-off between expenditure in current and future regulatory periods,⁴⁶⁰ while Powerco submitted that the Commission should explain how much weight will be given to longer term benefits.⁴⁶¹ The Commission notes that the evaluation criteria must be considered in light of the Part 4 Purpose, which has as its central purpose the long-term benefit of consumers. Hence, although the assessment of expenditure is confined to the CPP regulatory period, the Act clearly provides a longer term emphasis. Therefore, the expenditure objective refers to the ‘longer term’ to signify that the Commission will have regard to circumstances beyond the CPP regulatory period.

Criterion e: Quality standard variations (EDBs only)

- 9.4.13 The Commission considers that it would promote certainty by including a specific evaluation criterion in respect of proposals to vary the existing DPP quality standards

⁴⁵⁶ Farrier Swier, *Assessing expenditure in a Customised Price-Quality Path review: Electricity distribution, gas distribution and gas transmission*, 3 June 2009.

⁴⁵⁷ See, for example, Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 26, paragraph 100.

⁴⁵⁸ Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 13-15; Vector Limited, *Cross Submission on Input Methodologies Draft Reasons Paper*, 3 September 2010, pp. 14-15, paragraphs 46-47; Vector Limited, *Submission on EDBs and GPBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, p. 3, paragraph 12. Orion also considered that additional guidance should be provided to suppliers (see: Orion New Zealand Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 2, paragraph 8.5).

⁴⁵⁹ Strata Energy Consulting, *Input Methodologies, Review of submissions on CPP information requirements for capex, opex and demand*, 18 October 2010, p. 8.

⁴⁶⁰ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 26, paragraph 100; and PricewaterhouseCoopers on behalf of 20 EDBs, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 9-10, paragraph 20.

⁴⁶¹ Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 15.

(i.e. a proposed ‘quality standard variation’).⁴⁶² This criterion is discussed in paragraph 9.3.29 above and submitters supported its inclusion.⁴⁶³

9.4.14 The IM Determinations do not provide for GPBs to propose variations to the existing DPP quality standards, so this criterion will only apply to any ‘quality standard variations’ proposed by EDBs.

Criterion f: Consumer consultation

9.4.15 A CPP should promote the long-term benefit of consumers. Consumer feedback will be particularly relevant where different price/quality tradeoffs are available and proposed investments or changes to quality are justified on the basis of consumer demands.

9.4.16 The Commission acknowledges that the supplier may have a better understanding of the need for network investment than its consumers, which is why consumer agreement to the proposed CPP is not required. Instead, the Commission will take into account the extent of support (or opposition) for the supplier’s proposal. Submitters supported the inclusion of this criterion.⁴⁶⁴

Suggestion of additional criterion - assessing financeability

9.4.17 ENA⁴⁶⁵ (supported by other submitters)⁴⁶⁶ proposed the inclusion of a criterion to assess “whether the CPP proposal provides sufficient cash flow to enable the supplier to prudently manage its expenditure requirements throughout the CPP period.”

9.4.18 The Commission considers that it is difficult to evaluate the financeability of a regulated supplier’s operations given:

- the subjective nature of third party credit rating processes;

⁴⁶² ‘Quality standard variation’ is defined in the EDBs IM Determination and discussed in paragraphs 9.3.26 to 9.3.27 above.

⁴⁶³ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 27, paragraph 101; Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 21, paragraph 74.

⁴⁶⁴ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 27, paragraph 102; Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 22, paragraph 79. The Commission notes that Unison (supported by Vector in its cross-submission) submitted that they doubt that consumers would be able to, or have an interest in responding to consultation on a CPP application. They suggested that if evidence manifests itself that consumers’ responses are of limited number and use, Subpart 8 of the determination could be omitted (Unison Networks Ltd, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 4, paragraph 17; and Vector Limited, *Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, 3 September 2010, p. 18, paragraph 59).

⁴⁶⁵ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 27-28, paragraph 103-105; Electricity Networks Association, *Submission on EDBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, p. 2, paragraphs 7-8;

⁴⁶⁶ Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 4, paragraph 10; Wellington Electricity Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 18; PricewaterhouseCoopers on behalf of 20 EDBs, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 8, paragraph 16; GasNet Limited, *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper*, 9 August 2010, p. 24, paragraph 91.

- any assessment of the level of debt attributable to a supplier's regulated business compared to the overall level of a multi-sector supplier's borrowings will be notional, and the assumptions applied are likely to have a material effect on assessing financeability; and
- the potential access to internal financing.

9.4.19 In making a CPP proposal, suppliers have the opportunity to propose an alternative depreciation approach (see Chapter 4) and the Commission considers that, if taken up and implemented, it will, among other things, help to mitigate any financeability concerns. Furthermore, the Commission considers that financeability considerations are already implicit in the other evaluation criteria (particularly criterion b), most noticeably in its assessment of the appropriate balance between P₀/X. CPP applicants are not precluded from providing additional information in their proposal should they wish, including on financeability.

9.4.20 For the above reasons, the Commission has not included a criterion to specifically evaluate financeability.

Conclusion

9.4.21 The Commission considers that the evaluation criteria provide a reasonable balance between certainty for the supplier as to how its proposal will be assessed, and flexibility for the Commission to tailor its assessment to the nature of the proposal and the specific reasons for it. It is neither possible, nor desirable, for the Commission to specify in detail the nature of the assessment that it is likely to undertake during the 150 working day assessment period because this will depend heavily on the type of proposal that is received.

9.5 Forecast Expenditure

Introduction

9.5.1 As discussed in paragraphs 9.3.10 to 9.3.11, the assessment of expenditure is expected to be an important part of determining CPPs. Setting an appropriate level of expenditure for a regulatory period requires the exercise of judgement by both the supplier (in making its forecast) and the Commission (in assessing the forecast). Given the information asymmetry between the Commission and regulated suppliers, as well as the tight statutory timeframes for determining CPPs, it is not practicable, nor desirable, for the Commission to attempt to replicate the asset management and decision-making processes of an applicant involved in preparing expenditure forecasts. However, in light of the potential for the supplier to use this information asymmetry to obtain a higher allowance than is necessary to provide the regulated services, a robust, independent assessment of the proposed allowances is necessary. Sufficient information to undertake that assessment is therefore a key part of the CPP information requirements.

9.5.2 Under a CPP, the Commission will determine an *ex ante* allowance for expenditure in the allowed revenue and then the supplier has the freedom to prioritise the projects and programmes it actually undertakes throughout the regulatory period without further intervention from the Commission. This approach works particularly well for distribution businesses where the size of new investment relative to the capex

allowance is typically small, facilitating reprioritisation of the work programme if new unforeseen projects arise.

9.5.3 In some sectors, however, it may be preferable to build in mechanisms for reconsidering the expenditure allowance to address uncertainty in costs that is not best managed by the supplier. This is often the case with transmission businesses, where the size of new investments can be much greater than the historical level and a material proportion of the total RAB. Reprioritisation might not be possible in this situation and efficient investments may be deferred. The Commission has therefore incorporated additional mechanisms for dealing with contingent or unforeseen gas transmission investments.

9.5.4 The remainder of this section on expenditure:

- summarises expert advice obtained by the Commission on opex/capex information requirements;
- discusses the assessment of forecast expenditure for a CPP;
- summarises the information requirements necessary to support that assessment. (with further detail provided in Appendix K3); and
- **GTBs only:** discusses the mechanisms for dealing with contingent or unforeseen gas transmission investments.

Expert advice on opex/capex information requirements

9.5.5 The Commission engaged Farrier Swier and Strata to assist it in determining the appropriate approach to assessing expenditure under a CPP and the information requirements necessary to support that assessment.

9.5.6 In light of advice from Farrier Swier (see paragraph 9.4.10),⁴⁶⁷ the Commission provided working assumptions to Strata to assist it in developing CPP opex/capex/demand information requirements, with separate requirements for EDBs, GDBs and GTBs. This included the ‘expenditure objective’ that the Commission would use in evaluating expenditure. The Commission has held several rounds of consultation on Strata’s draft requirements, including workshops in March and May 2010. The consultation on expenditure requirements is described in further detail in Appendix K3.

Assessing expenditure

9.5.7 A building blocks analysis will be used to determine a CPP, and capex and opex forecasts will be incorporated into a building blocks model.⁴⁶⁸

⁴⁶⁷ Farrier Swier, *Assessing expenditure in a Customised Price-Quality Path review: Electricity distribution, gas distribution and gas transmission*, 3 June 2009. The Commission consulted on this report along with its Input Methodologies Discussion Paper in June 2009.

⁴⁶⁸ In contrast, under information disclosure regulation *actual* capex and opex for the years of the CPP regulatory period will be disclosed, and such actual data will inform DPP starting price adjustments and CPP proposals in subsequent periods.

Top-down service based approach

- 9.5.8 The Commission's assessment of proposed expenditure will be against the expenditure objective (which is discussed in paragraphs 9.4.10 to 9.4.12. The information required in a CPP proposal should be sufficient to assess proposed expenditure against this criterion. The assessment considers whether the proposed expenditure is necessary to meet consumer demands (including for quality) and/or regulatory requirements that the supplier must meet. The service-based approach is appropriate in the context of Part 4 of the Act (from which the expenditure objective is derived) as it links consumers' demands for quality of service with the revenue that can be recovered from consumers. It promotes investment in the provision of regulated services (s 52A(1)(a)), where this can be linked to the provision of services at a quality demanded by consumers (s 52A(1)(b)).⁴⁶⁹
- 9.5.9 At this stage of the Part 4 regulatory regime, the Commission does not consider that DPPs are likely to be able to provide an appropriate baseline for forecast expenditure that can be adjusted on an incremental basis to take account of 'additional' investment required under a CPP.⁴⁷⁰ This is because:
- the way that a DPP is set will not include an assessment of forecast expenditure over the regulatory period or an explicit allowance for opex or capex (paragraphs 2.8.15 to 2.8.22 discuss how DPPs will be set); and
 - this is the first time that most EDBs and GPBs will be subject to price/quality regulation, therefore the incentives for cost minimisation that can be expected from price control have not yet taken full effect.
- 9.5.10 It is therefore necessary for the Commission to obtain assurance that all proposed expenditure is appropriate. This does not mean that the Commission will undertake a detailed assessment of the supplier's entire expenditure programme. The Commission considers that its role in assessing CPP expenditure forecasts should be analogous to that of the supplier's Board, and a similar level of information is appropriate. The top-down approach allows the Commission to focus on gaining assurance that applicants are operating well-run, prudent businesses that deliver services efficiently.
- 9.5.11 Some regulated suppliers have submitted that the information required by the Commission is greater than that which would be required by a well-run business, particularly for later years of a CPP regulatory period; and that work will be required to ensure that internal documents are fit for the purpose of a CPP application.⁴⁷¹ The

⁴⁶⁹ Accordingly, suppliers will have the flexibility to propose the service categories, measures and levels for their CPP proposal.

⁴⁷⁰ Over time, it may be appropriate to place greater reliance on the efficiency of historic expenditure levels as suppliers will have been subject to incentive regulation. This will particularly be the case where a supplier is subject to consecutive CPPs as the Commission will have undertaken a detailed assessment of expenditure requirements for the previous period. Wellington Electricity supported this approach, See: Wellington Electricity Lines Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 9-10; and Wellington Electricity Lines Limited, *Submission on EDBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, p. 7.

⁴⁷¹ For example: Electricity Networks Association, *Submission 9 Customised Price Quality Path Input Methodology*, 23 August 2010, p. 58, paragraph 226; Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 12; PricewaterhouseCoopers on behalf of 20 EDBs, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 10-11, paragraphs 23-24.

Commission recognises that this work may be required, at least initially, as some suppliers have not been subject to regulatory assessment of their expenditure up to this point. However, it is worth noting that Vector considers that the availability and quality of information has improved in the price-controlled part of its business (the Auckland gas network subject to the Gas Authorisation) compared to the unregulated parts and that it had been a valuable process in that respect.⁴⁷² The Commission also accepts that a Board would not expect information to be provided at this level over a five to seven year timeframe. However, this is necessary under an incentive regulation regime such as default/customised price-quality regulation. Unlike the Commission when it determines a CPP, Boards do not typically approve expenditure for periods of up to five years in advance without reassessing whether the expenditure is required closer to the time.

Deliverability

9.5.12 The deliverability of the proposed expenditure programme is an important issue for the Commission to gain assurance on, particularly where a CPP applicant proposes a significant step change in its expenditure requirements. Although a supplier may be in a position to justify the proposed expenditure from a technical perspective or in terms of the willingness of its consumers to pay for the proposed investments, it must also be able to demonstrate that it is not constrained in its ability to carry out the work in the timeframes proposed. For instance, deliverability may be affected by the availability of necessary engineering staff to plan the work, the likelihood of obtaining the required planning and resource consents, and the availability of labour to undertake the work. Where a step change is proposed, the supplier must be in a position to undertake the work in addition to its business-as-usual programme, rather than simply substituting business-as-usual opex or capex. The Commission considers that this is something that any Board authorising expenditure would reasonably expect to receive assurance on. Information that allows assessment of deliverability of the expenditure programme is therefore required to be included in a CPP proposal.⁴⁷³

Verification

9.5.13 A key aspect of the Commission's expenditure approach is the use of pre-submission verification (prescribed by the Commission) of proposed expenditure by an independent verifier. This should promote certainty for suppliers as to how their expenditure will be assessed, as well as assist the Commission in managing the tight statutory timeframes for assessment. Suppliers have an opportunity to rectify any concerns raised by the verifier before it applies for a CPP and the process should allow the Commission to focus on the most important aspects of the CPP proposal during its assessment period. Regulated suppliers supported this verification

⁴⁷² Mr. Verster for Vector, *Opex/Capex for CPP Proposals Workshop Transcript*, 30 March 2010, lines 15-24, p. 45.

⁴⁷³ Wellington Electricity considered that 'deliverability' should be considered only at an aggregate capex and opex level, not at the level of expenditure categories or individual projects/programmes. It considered that requiring information on deliverability at a disaggregated level is not required for the purpose of forecasting required expenditure, nor consistent with how it resources its expenditure programs (i.e. through the use of external resources). (See Wellington Electricity Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 11, paragraph 2.3.3.2; Wellington Electricity Lines Limited, *Submission on EDBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, pp. 5-6, paragraph 3.2). In order to undertake its assessment, the Commission requires information at a sufficiently disaggregated level. It also expects that suppliers will be able to provide deliverability information to this level of detail, even if they resource the work externally, as they are likely to seek similar assurances from outside service providers during contract negotiations.

approach.⁴⁷⁴ The details of the verification framework are discussed in detail in Section 9.6 and Appendix K4.

Opex/capex information requirements

Materiality

9.5.14 Although the Commission must be able to gain assurance on the entire expenditure programme, the concept of materiality is important to the information requirements to promote a cost-effective approach. The requirements place a greater emphasis, and require more detailed supporting information, on material aspects of the proposal. The use of a materiality approach was supported by interested parties in submissions, with parties strongly in favour of targeting the information to be provided to the drivers for the proposal.⁴⁷⁵

9.5.15 Suppliers will be required to provide more detailed information on a subset of projects and programmes. Detailed information must be provided if a project or programme is:⁴⁷⁶

- one of the five largest opex projects or programmes by total expenditure;
- one of the five largest capex projects or programmes by total expenditure; or
- one of ten additional projects or programmes selected by the verifier based on preset selection criteria that relate to the business-specific key drivers of the proposal.

9.5.16 The materiality approach should allow for a more cost-effective CPP regime by reducing the costs of preparing an application and allowing the assessment of a proposal to be better focused on the specific drivers for the proposal.

9.5.17 Further discussion of the materiality approach is provided in Appendix K3.

One set of requirements for all suppliers

9.5.18 The Commission considers that the same information requirements should be set for suppliers of all sizes as the Commission considers that the same type of supporting information for proposed expenditure is relevant to all suppliers. It also expects to apply the same degree of scrutiny to all proposals. The Commission considers that the type of information that will be required by a Board of a well-governed business should not be significantly different depending on its size. Assessing a simpler

⁴⁷⁴ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 76, paragraph 307.

⁴⁷⁵ PricewaterhouseCoopers, *Post-Workshop Submission on Input Methodologies (Electricity Distribution) Emerging Views Paper - Customised Price-Quality Path Capex/Opex Information Requirements, made on behalf of 21 Electricity Distribution Businesses*, 19 April 2010, pp. 8-9; Powerco Limited, *Post-Workshop Submission Customised Price-Quality Path*, 19 April 2010, pp. 9-11; Unison Limited, *Post Workshop Submission on Customised Price-Quality Path Capex/Opex Information Requirements*, 19 April 2010, p. 5 and Attachment 1, answer to Q 19; Electricity Networks Association, *Post Workshop Submission on Customised Price-Quality Path Capex/Opex Information Requirements*, 19 April 2010, pp. 1-2; Vector Limited, *CPP Post-Workshop Submission*, 19 April 2010, Appendix 1, pp. 7-8; Wellington Electricity Lines Limited, *Post-Workshop Submission on Customised Price-Quality Path*, 19 April 2010, pp. 8; Wellington Electricity Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 10.

⁴⁷⁶ More detailed information must also be provided on the two largest categories of non-system fixed asset capex by total expenditure.

(smaller) business may be more straightforward, and this would be reflected in proposals.

Role of information disclosure

- 9.5.19 The Commission's view is that the information requirements for CPPs should align with the current or expected information disclosure requirements to the extent practicable as this should, over time, lead to a more cost-effective approach across the regime.
- 9.5.20 The timeframes for which information should be produced for CPP application purposes should also, as far as possible, be aligned with the relevant timeframes for information disclosure.

Standardisation of expenditure categories

- 9.5.21 Standardised categories and definitions already required to be applied (or expected to be applied) for information disclosure are used for the CPP information requirements. For EDBs these are set out in the October 2008 Disclosure Requirements.⁴⁷⁷ For GPBs, appropriate requirements do not yet exist.
- 9.5.22 Regulated suppliers expressed mixed views on the value of standardised categories during the consultation process. Some submitters (e.g. Powerco, Vector) supported the approach of standardised expenditure categories and considered that information disclosure requirements should align with the CPP requirements.⁴⁷⁸ Other submitters (e.g. Orion, MDL, GasNet) did not support the use of standardised information reporting categories.⁴⁷⁹
- 9.5.23 In addition to leading to a more cost-effective approach across the regime, the Commission considers that a standardised approach to expenditure information is appropriate because it will provide a consistent analytical framework for assessing CPP proposals and certainty and stability to suppliers.
- 9.5.24 The Commission expects that the expenditure categories that have been developed for CPPs will be consistent with expenditure categories used for information disclosure.⁴⁸⁰ The information requirements are closely aligned with those in the existing electricity distribution information disclosure requirements (e.g. expenditure

⁴⁷⁷ Commerce Commission, *Electricity Information Disclosure Requirements issued 31 March 2004 (Consolidating all amendments to 31 October 2008)*, 31 October 2008.

⁴⁷⁸ Mr. Verster for Vector, *Opex/Capex for CPP Proposals Workshop Transcript*, 31 March 2010, lines 7-20, p. 9; Powerco Limited, *Post-Workshop Submission Customised Price-Quality Path*, 19 April 2010, p. 9, paragraph 38-40.

⁴⁷⁹ Orion New Zealand Limited, *Post-Workshop Submission on the CPP Information Requirements Workshop*, 19 April 2010, paragraph 20; GasNet Limited, *Post Workshop Submission on Customised Price-Quality Path Capex/Opex Information Requirements*, 19 April 2010, p. 3, paragraph 7; Orion New Zealand Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 4-5, paragraphs 8.11-8.13; Maui Development Limited, *Submission on GPBs Revised Input Methodologies Draft Determination Part 5*, 18 November 2010, p. 5, paragraphs 6.1-6.5.

⁴⁸⁰ The Commission initially consulted on the appropriate expenditure categories in its Information Disclosure Discussion Paper in July 2009 (ID Discussion Paper). The Commission's consultation in respect of the CPP information requirements has built on this, providing the Commission with an opportunity to engage with industry technical experts in greater detail on the appropriate expenditure categories.

categories, network asset information and demand, consumer numbers and generation forecasts).⁴⁸¹

GTBs only: Contingent projects and unforeseen projects

9.5.25 As discussed in paragraph 9.5.2, the Commission has incorporated additional mechanisms for dealing with uncertain or unforeseen gas transmission investments by adopting a contingent/unforeseen project approach, whereby:

- the costs of particular large investments are not provided for in the *ex ante* revenue allowance where the need, timing, and/or costs of the project are uncertain or the project is unforeseen when a proposal is submitted;
- the Commission will only reconsider the price path if the GTB satisfies the Commission that the project will proceed; and
- the amendment to the price path will not take effect until the year in which assets associated with the project are forecast to be commissioned.

9.5.26 The Commission considers that adopting such an approach for GTBs under a CPP is consistent with the Part 4 Purpose because it provides a balance between:

- promoting outcomes that provide incentives for suppliers to undertake investments (consistent with s 52A(1)(a)) in order to provide services at the quality demanded by consumers (consistent with s 52A(1)(b)), because a supplier will have greater certainty that it will be able to recover its efficiently incurred costs, as the price path will be adjusted to account for their cost where the GTB satisfies the Commission that it will proceed; and
- limiting the ability of suppliers to extract excessive profits, because a supplier will not be able to recover the costs of the project unless the Commission is satisfied that it will proceed (consistent with s 52A(1)(d)).

Criteria for inclusion as a contingent project

9.5.27 Contingent projects are tied to a specific trigger event and forecast costs must meet a materiality threshold. Furthermore, the GTB must demonstrate that the assets associated with the project are likely to be commissioned during the CPP regulatory period.⁴⁸²

9.5.28 A trigger event is a condition or event that (among other things) is not within the control of the GTB and would reasonably cause the GTB to undertake the project. For example, MDL has indicated that it will need to construct additional pipeline capacity if a new gas-fired power station is built.⁴⁸³ This is an example of a possible trigger event. Furthermore, the forecast or indicative capex of the project must be at least 10 per cent of the value of the applicant's most recently disclosed annual revenue. This is equivalent to an increase of approximately one per cent per annum

⁴⁸¹ The Commission will continue to consult on the appropriate information disclosure requirements for EDBs and GPBs in the context of Part 4 in 2011. If any changes are made to the existing information requirements for EDBs that are also specified in a CPP, the Commission may amend the IMs for consistency purposes.

⁴⁸² The information requirements in a CPP proposal for contingent projects are set out in Schedule D of the GTBs IM Determination.

⁴⁸³ Maui Development Limited, *Submission on the Input Methodologies Discussion Paper*, July 2009, pp. 11-12.

of the annual allowable revenue and is consistent with the materiality threshold that forms part of the cost allocation IM (see Appendix B).

9.5.29 Vector proposed a materiality threshold of 20 per cent of the average annual capex budget.⁴⁸⁴ MDL considered that there should be more discretion as to what constitutes a material project, because some projects may not meet the threshold but are material in terms of the way they can affect the gas market.⁴⁸⁵ The threshold was selected to exclude lower value projects that could be undertaken by reprioritising the capex programme. The Commission considers that the materiality threshold is set at an appropriate level.

9.5.30 Proposals must include sufficient information to enable the Commission to identify whether a project satisfies the contingent project criteria. The independent verifier will be required to provide an opinion as to whether the project satisfies the criteria. Projects approved as contingent projects (and the trigger events for each project) will be identified in a CPP determination. The Commission may also decide to classify other projects (than those proposed by the supplier) as contingent projects.

Unforeseen projects

9.5.31 Vector submitted that it is difficult to develop a set of projects upfront as many large capital projects arise from customer requests or major changes in consumption patterns and suppliers do not generally know about requirements very far in advance.⁴⁸⁶

9.5.32 On balance, the Commission considers that it is appropriate to accommodate 'unforeseen projects' under the contingent project mechanism if the project satisfies the following criteria:

- it was unforeseeable to a prudent operator of gas transmission services at the time it submitted its CPP proposal; and
- it meets the same materiality threshold as a contingent project.

9.5.33 The inclusion of this mechanism was supported by MDL.⁴⁸⁷

Reconsidering the price path

9.5.34 A GTB may apply to the Commission to reconsider the price path where a trigger event has occurred or an unforeseen project has commenced or is committed to proceed during the CPP regulatory period.

9.5.35 Reconsideration arising from a contingent project or unforeseen project is not an opportunity to reconsider all aspects of the original proposal. Rather it allows the

⁴⁸⁴ Vector Limited, *Submission on Gas Transmission (Input Methodology) Draft Determination, Parts 4 and 5*, 7 September 2010, clause 5.5.3 (mark-up).

⁴⁸⁵ Maui Development Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 10, paragraph 7.6.

⁴⁸⁶ Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 61, paragraph 236; Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 46, paragraph 176.

⁴⁸⁷ Maui Development Limited, *Submission on GPBs Revised Input Methodologies Draft Determination Part 5*, 18 November 2010, p. 5, paragraph 5.2.

Commission the opportunity to scrutinise the justification for the proposed incremental increase in forecast capex and opex, over and above the forecast capex and opex already provided for in maximum allowable revenue. Any amendment to the price path will not take effect until the year in which assets associated with the project are forecast to be commissioned.

Accommodating gas transmission investments under the DPP

9.5.36 Vector and MDL submitted that DPPs should also include a mechanism for accommodating uncertain or unforeseen gas transmission investments.⁴⁸⁸ For instance, Vector submitted that the costs of such investments could be accommodated in DPPs under the re-opener provisions.⁴⁸⁹

9.5.37 The Commission does not consider it appropriate to provide a re-opener under DPPs. DPPs do not establish an explicit baseline level of forecast expenditure against which incremental changes may be assessed. Therefore, providing a re-opener may result in GTBs being compensated for additional costs, even if sufficient compensation is already provided for some or all of those costs under a DPP. This may lead to prices being higher than is needed to be consistent with s 52A(1)(d).

9.6 Consumer Consultation, Audit, Verification and Certification

9.6.1 Section 52T(1)(d)(i) requires, among other things, that IMs include the requirements a supplier must meet in relation to the extent of independent verification and audit, and the extent of consultation and agreement with consumers. This section discusses these requirements. It also discusses requirements relating to director certification.

9.6.2 The CPP that is determined should be one that promotes the long-term benefit of consumers, therefore, an understanding of consumer demands is important to determining an appropriate CPP. Given that the Commission considers that it is important for CPP applicants to consult with their consumers, it has included consumer consultation requirements in the IM.

9.6.3 It is also important that the Commission is able to rely on information contained in a CPP proposal. Therefore, the Commission considers that the proposal should be verified in some way before it is submitted to the Commission. The key considerations when selecting the appropriate form of verification are how critical the information is to the decision and the amenability of the information to the different types of verification, of which there are three main types:

- self-verification of information by the regulated supplier (referred to as ‘certification’);
- independent audits of information (referred to as ‘audit’); and

⁴⁸⁸ Maui Development Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 3-4, paragraph 2.6, p. 7, paragraph 4.4-4.6 and p. 12, paragraph 10.10; Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 46, paragraph 176 and pp. 52-55.

⁴⁸⁹ Vector Limited, *Submission on EDBs and GPBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, p. 2, paragraphs 7-9.

- independent opinions on information by a subject matter expert (referred to as ‘independent verification’).

Requirements to be met by the supplier – certification

- 9.6.4 Certification of information by the directors of a regulated supplier is a relatively low-cost means of verification. The imposition of clear obligations and penalties should provide incentives for suppliers to implement systems and controls that will ensure the production of accurate and reliable information.
- 9.6.5 The Commission will require certification of the information in a proposal.⁴⁹⁰ In deciding what should be attested to and the number of directors required to certify the information, the Commission has considered the criticality of the information in question and the nature of the information (for instance, whether it is factual or a matter of opinion).

Requirements to be met by the supplier – audit

- 9.6.6 The purpose of audit reports is to provide independent assurance that information complies with the relevant requirements. Audit is most appropriate when an opinion as to the fair presentation of historic financial information is sought. Audits of financial information usually present few evidential problems as businesses are required to retain supporting documents for statutory financial reporting purposes. Audits of non-financial information may be more difficult to perform as there may not be requirements to keep relevant records.
- 9.6.7 In relation to forecast information, audit opinions tend to be restricted to assurance that a forecast has been properly compiled on the basis of relevant assumptions as it is not realistic for an auditor to provide an opinion on the reasonableness or appropriateness of assumptions.⁴⁹¹
- 9.6.8 In deciding whether an audit opinion should be required, the Commission first considered whether the information in question was amenable to audit and whether the level of reliance to be placed on the information justified the costs of having the information audited. In respect of forecast information, it also decided that an audit opinion will only be required for financial information in respect of whether the calculations have been compiled in accordance with the IM Determinations.
- 9.6.9 Audit reports that have been obtained to meet other requirements (such as information disclosure requirements) can be relied upon, provided they meet the audit requirements in the IM Determinations.

Requirements to be met by the supplier – independent verification

- 9.6.10 As discussed above, the scope for obtaining audit assurance in respect of forecast information is narrower than in respect of historic information. Where auditors do not have the expertise to verify or provide an opinion on the subject matter or the subject matter itself is not amenable to audit, an expert opinion may be more suitable.

⁴⁹⁰ All certification requirements are accompanied by a continuing duty to inform the Commission as soon as reasonably practicable after the certifier changes his or her opinion as to the validity of the attestation or becomes aware that a fact is untrue (or has significant cause to doubt the accuracy of the fact).

⁴⁹¹ Assessing the reasonableness of assumptions used in the development of expenditure forecasts will be one of the tasks of the independent verifier.

- 9.6.11 An expert opinion is likely to be of most value where judgement is required as to the reasonableness of the assumptions or practice used in developing the information (e.g. the methods used to develop opex forecasts), or where it is necessary to draw conclusions from that information (e.g. its efficiency or prudence).
- 9.6.12 Expert opinion would be of particular value in the assessment of information that is critical to the Commission's decision-making, including forecasts of opex, capex and demand. The Commission will, therefore, require suppliers to engage an independent verifier to provide an expert opinion on certain components of its proposal, prior to submitting their proposal to the Commission.
- 9.6.13 An applicant must obtain an independent verifier's report to accompany its proposal. The independent verifier must be engaged in accordance with the process set out in Schedule F of the IM Determinations. The key task of the verifier is to provide an independent verification report in respect of the proposal, prepared in accordance with the terms of reference specified in Schedule G of the IM Determinations.
- 9.6.14 The Commission will need to undertake its own assessment of the proposal in order to make a s 52P determination as is required under the Act. In doing so, to the extent practicable, the Commission will seek to avoid duplication of effort and to rely on the professional opinion expressed by the verifier.
- 9.6.15 Further detail on the verification process is discussed in Appendix K4.

Requirements to be met by the supplier – consumer consultation

- 9.6.16 The requirement relating to consumer consultation is one of 'adequate notification', by which the Commission means that the process, the medium used and the information provided must be sufficient to enable consumers to engage.⁴⁹² This will likely differ according to the specific consumer base and the nature of the CPP proposal, and the supplier has discretion as to how it engages with its consumers.
- 9.6.17 Some suppliers sought clarification of what is considered 'adequate'.⁴⁹³ The Commission has intentionally left it broad to allow suppliers to exercise some discretion as to the proposed channel of communication, given the nature of their consumer base.
- 9.6.18 Consumer consultation will be required for all CPP applications. Some submitters suggested that consultation should not be required where a proposal arises from a catastrophic event because the proposal will be targeted at maintaining existing supply obligations.⁴⁹⁴ The Commission disagrees and considers that consumers are

⁴⁹² ENA supported the requirements regarding evidence of consultation in principle. Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 74, paragraph 295.

⁴⁹³ Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 15; Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, paragraph 80, p. 22.

⁴⁹⁴ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 8, paragraph 31 and p. 73, paragraph 291; Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper, Customised Price-Quality Paths*, 25 August 2010, p. 4, paragraph 17.

just as, if not more, likely to wish to be consulted if significant reconstruction of the network is proposed to rectify the catastrophic event.

9.6.19 A supplier must have initiated its consultation process by no later than 40 working days prior to submission of the CPP proposal by adequately notifying its consumers:

- that it intends to make a CPP proposal;
- of the expected effect on the revenue and quality of the relevant regulated services;
- **GPBs only:** of the expected effect on each pipeline charge (if a GPB is required to provide its pricing methodology in its proposal);
- of the process for making submissions;
- where and how further information may be obtained; and
- of their opportunity to participate in the Commission's consultation process (required under s 53T).

9.6.20 The timeframe specified above is intended to ensure that the information that is consulted on is the information that is likely to be submitted to the Commission as part of the CPP proposal.

PART 2: APPENDICES

APPENDIX A: INPUT METHODOLOGIES CONSULTATION PROCESS

- A1.1 This Appendix sets out the key consultation documents that the Commission has released as part of its consultation process for EDBs' and GPBs' IMs to date, including expert reports that accompanied those consultation papers. It also lists the transcripts from the conference and workshops that the Commission has held in relation to EDBs and GPBs.
- A1.2 The list is not intended to include all documents or information provided to or by interested parties in relation to IMs. Unless indicated otherwise, the report is a Commission report.

Table A1 Key Consultation Papers for IMs (EDBs and GPBs)

Date of Release	Report Name
11 December 2008	Notice of intention to start work on Input Methodologies
19 December 2008	Regulatory Provisions of the Commerce Act 1986 Discussion Paper
19 June 2009	Input Methodologies Discussion Paper
19 June 2009	Revised Draft Cost of Capital Guidelines, with expert report: <ul style="list-style-type: none"> o Franks, J., Lally M., & Myers S., <i>Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology</i>, 18 December 2008
19 June 2009	Farrier Swier Consulting, <i>Assessing expenditure in a Customised Price-Quality Path review: Electricity distribution, gas distribution and gas transmission</i> , 3 June 2009
22 September 2009	Transcript - Input Methodologies Conference - Gas Pipelines, 16 September 2009
22 September 2009	Transcript - Input Methodologies Conference - Electricity Distribution, 17 September 2009
22 September 2009	Input Methodologies Conference - Invitation for Post-conference Submissions
27 October 2009	Cost of Capital Straw-person Worked Example (for discussion at workshop on 12-13 November 2009)
18 November 2009	Transcript - Cost of Capital Workshop - Day 1, 12 November 2009
18 November 2009	Transcript - Cost of Capital Workshop - Day 2, 13 November 2009
18 November 2009	Cost of Capital: Invitation for Post-Workshop Submissions
18 November 2009	Cost of Capital: Effects of Leverage on WACC Under Two Different CAPMs (A spreadsheet "BL versus classical CAPM" underpinning this paper was released on 26 November 2009)

Date of Release	Report Name
18 November 2009	Dr Martin Lally, <i>WACC and Leverage</i> , 17 November 2009
10 December 2009	Update on Process to Determine Input Methodologies and Airports Information Disclosure
23 December 2009	Input Methodologies (Gas Pipeline Services) Emerging Views Paper (A spreadsheet underlying Figures A1 and A2 of the Gas Pipelines Emerging Views Paper was released on 19 January 2010)
23 December 2009	Input Methodologies (Electricity Distribution) Emerging Views Paper (A spreadsheet underlying Figures A1 and A2 of the Electricity Distribution Emerging Views Paper was released on 19 January 2010)
10 February 2010	Transcript - Input Methodologies Tax Workshop, 8 February 2010
10 February 2010	Invitation for Tax Post-Workshop Submissions
11 February 2010	<p>CPP Workshop (March 2010) Notification and consultation materials:</p> <ul style="list-style-type: none"> ○ CPP - Independent Verifier Engagement Framework and Terms of Reference; and ○ expert reports from Strata Energy Consulting (all dated February 2010): <ul style="list-style-type: none"> ○ <i>Specifying the CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand (draft) - For the Commerce Commission;</i> ○ <i>Draft qualitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - For the Commerce Commission;</i> and ○ <i>Draft quantitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - For the Commerce Commission</i>
16 February 2010	<p>EDB/GPB Workshop (24-25 February 2010) - Notification and additional materials:</p> <ul style="list-style-type: none"> ○ Asset Valuation Table ○ Cost Allocation
2 March 2010	Transcript - EDB/GPB Workshop Day 1, 24 February 2010
2 March 2010	Transcript - EDB/GPB Workshop Day 2, 25 February 2010
2 March 2010	Invitation for EDB/GPB Post-Workshop Submissions, 1 March 2010 (revised 5 March 2010)
6 April 2010	Transcript - CPP Workshop Day 1, 30 March 2010
6 April 2010	Transcript - CPP Workshop Day 2, 31 March 2010

Date of Release	Report Name
7 April 2010	<p>Invitation for CPP Post-workshop Submissions, with expert reports from Strata Energy Consulting Limited (all dated April 2010):</p> <ul style="list-style-type: none"> ○ <i>Draft qualitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - Gas Transmission - For the Commerce Commission;</i> ○ <i>Draft quantitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - Gas Transmission - For the Commerce Commission;</i> ○ <i>Draft quantitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - Gas Distribution - For the Commerce Commission; and</i> ○ <i>Draft qualitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - Gas Distribution - For the Commerce Commission</i>
20 May 2010	<p>Workshop on CPP Opex/Capex Requirements for Gas Pipeline Services Minutes made available on the Commission's website</p>
14 May 2010	<p>Update on Process to Determine Input Methodologies</p>
31 May 2010	<p>Expert reports relevant to EDBs and GPBs Draft Input Methodologies Determinations (released with Airports Draft Reasons Paper):</p> <ul style="list-style-type: none"> ○ Yarrow, G., Cave, M., Pollitt, M., Small, J., <i>Asset Valuation in Workably Competitive Markets - A Report to the New Zealand Commerce Commission</i>, May 2010; and ○ Franks, J., Lally, M., Myers, S., <i>Recommendation to the New Zealand Commerce Commission on whether or not it should change its previous estimate of the tax-adjusted market risk premium as a result of the recent global financial crisis</i>, 14 April 2010
18 June 2010	<p>Input Methodologies (Electricity Distribution Services) Draft Reasons Paper</p>
21 June 2010	<p>Input Methodologies (Gas Pipeline Services) Draft Reasons Paper</p>
2 July 2010	<p>Draft Commerce Act (Input Methodologies) Determinations: one each for EDBs / GDBs / GTBs</p> <p>Input Methodologies for Electricity Distribution Businesses and Gas Pipeline Businesses, Companion Paper (Draft Determinations and Customised Price Quality Path Requirements), with expert reports from Strata Energy Consulting Limited (all dated April 2010):</p> <ul style="list-style-type: none"> ○ <i>Specifying the CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - For the Commerce Commission;</i> ○ <i>Draft qualitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - Gas Distribution - For the Commerce Commission;</i> ○ <i>Draft quantitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - Gas</i>

Date of Release	Report Name
	<p><i>Distribution - For the Commerce Commission;</i></p> <ul style="list-style-type: none"> ○ <i>Draft qualitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - Gas Transmission - For the Commerce Commission;</i> ○ <i>Draft quantitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - Gas Transmission - For the Commerce Commission;</i> ○ <i>Draft qualitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - Electricity Distribution - For the Commerce Commission; and</i> ○ <i>Draft quantitative CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand - Electricity Distribution – For the Commerce Commission</i>
<p>16 July 2010</p>	<p>Expert Reviews of EDBs & GPBs Draft Reasons Papers</p> <ul style="list-style-type: none"> ○ Professor Martin Cave, <i>Expert Review of the New Zealand Commerce Commission’s Draft Decisions and Reasons for Electricity Distribution Services and Gas Pipeline Services</i>, July 2010; ○ Dr Michael Pollitt, <i>Expert Review of the New Zealand Commerce Commission’s Draft Decisions and Reasons for Electricity Distribution Services and Gas Pipeline Services</i>, July 2010; ○ Dr John Small, <i>Expert Review of the New Zealand Commerce Commission’s Draft Decisions and Reasons for Electricity Distribution Services and Gas Pipeline Services</i>, July 2010; and ○ Professor George Yarrow, <i>Review of Input Methodologies (Electricity Distribution Services and Gas Pipeline Services) Draft Reasons Paper</i>, July 2010
<p>22 October 2010</p>	<p>Revised Draft Commerce Act (Input Methodologies Electricity Distribution Services) Determination</p> <p>Input Methodologies (Electricity Distribution Services) Consultation Update Paper, with expert report:</p> <ul style="list-style-type: none"> ○ Strata Energy Consulting, <i>Input Methodologies – Review of submissions on CPP information requirements for capex, opex and demand – For the Commerce Commission</i>, 18 October 2010
<p>1 November 2010</p>	<p>Revised Draft Commerce Act (Input Methodologies Gas Distribution Services) Determination; and Revised Draft Commerce Act (Input Methodologies Gas Transmission Services) Determination</p> <p>Input Methodologies (Gas Pipeline Services) Consultation Update Paper, with expert report from Strata listed above (dated 18 October 2010) also relevant</p>

Date of Release	Report Name
<p>16 December 2010</p>	<p>Expert reports:</p> <ul style="list-style-type: none"> ○ Professor Martin Cave, <i>Expert Review of Reasons Papers of the New Zealand Commerce Commission relating to Electricity Distribution and Gas Pipeline Services and to Airports</i>, 13 December 2010; ○ Dr Martin Lally, <i>Comments on Input Methodologies (EDS) Draft Reasons Paper</i>, 3 September 2010; ○ Dr Martin Lally, <i>Comments on Measurement Error and Regulated Firms' Allowed Rates of Return</i>, 13 September 2010; ○ Dr John Small, <i>Response to CEG</i>, 23 November 2010; ○ Dr John Small, <i>Expert Review of Input Methodology Reasons Papers</i>, 14 December 2010; ○ Yarrow, G., Cave, M., Pollitt, M., Small, J., <i>Review of Submissions on Asset Valuation in Workably Competitive Markets - A Report to the New Zealand Commerce Commission</i>, November 2010; ○ Professor George Yarrow, <i>Comments on a CEG memorandum of 17 November 2010</i>, 14 December 2010; and ○ Professor George Yarrow, <i>Review of Input Methodologies (Electricity Distribution Services, Gas Pipeline Services and Airports) Reasons Papers</i>, 14 December 2010
<p>22 December 2010</p>	<p>Expert report:</p> <ul style="list-style-type: none"> ○ Dr Michael Pollitt, <i>Expert Review of the New Zealand Commerce Commission's Input Methodologies (Airport Services) Reasons Paper and Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper</i>, December 2010
<p>To be released on 23 December 2010</p>	<p>Commerce Act (Electricity Distribution Services Input Methodologies Determination) 2010</p> <p>Commerce Act (Gas Distribution Services Input Methodologies Determination) 2010</p> <p>Commerce Act (Gas Transmission Services Input Methodologies Determination) 2010</p> <p>Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper, 22 December 2010</p>

APPENDIX B: COMPONENTS AND APPLICATION OF THE COST ALLOCATION IM

B1 Introduction

B1.1 This section sets out the Commission's components of the cost allocation IM. The section is structured as follows:

- Section B2 provides an overview of the process for allocating costs;⁴⁹⁵
- Section B3 describes materiality screening tests (revenue materiality screening test, operating cost materiality screening test and regulated service asset value materiality screening test)⁴⁹⁶ and the interaction between the thresholds set for each test and the chosen materiality standard;
- Section B4 describes the accounting-based allocation approach (ABAA);
- Section B5 describes the avoidable cost allocation methodology (ACAM);
- Section B6 describes the optional variation to the accounting-based allocation approach (OVABAA);
- Section B7 explains the adjustments for arm's-length transactions; and
- Section B8 explains the application of the cost allocation IM under information disclosure and default/customised price-quality regulation.

B2 Cost Allocation Process

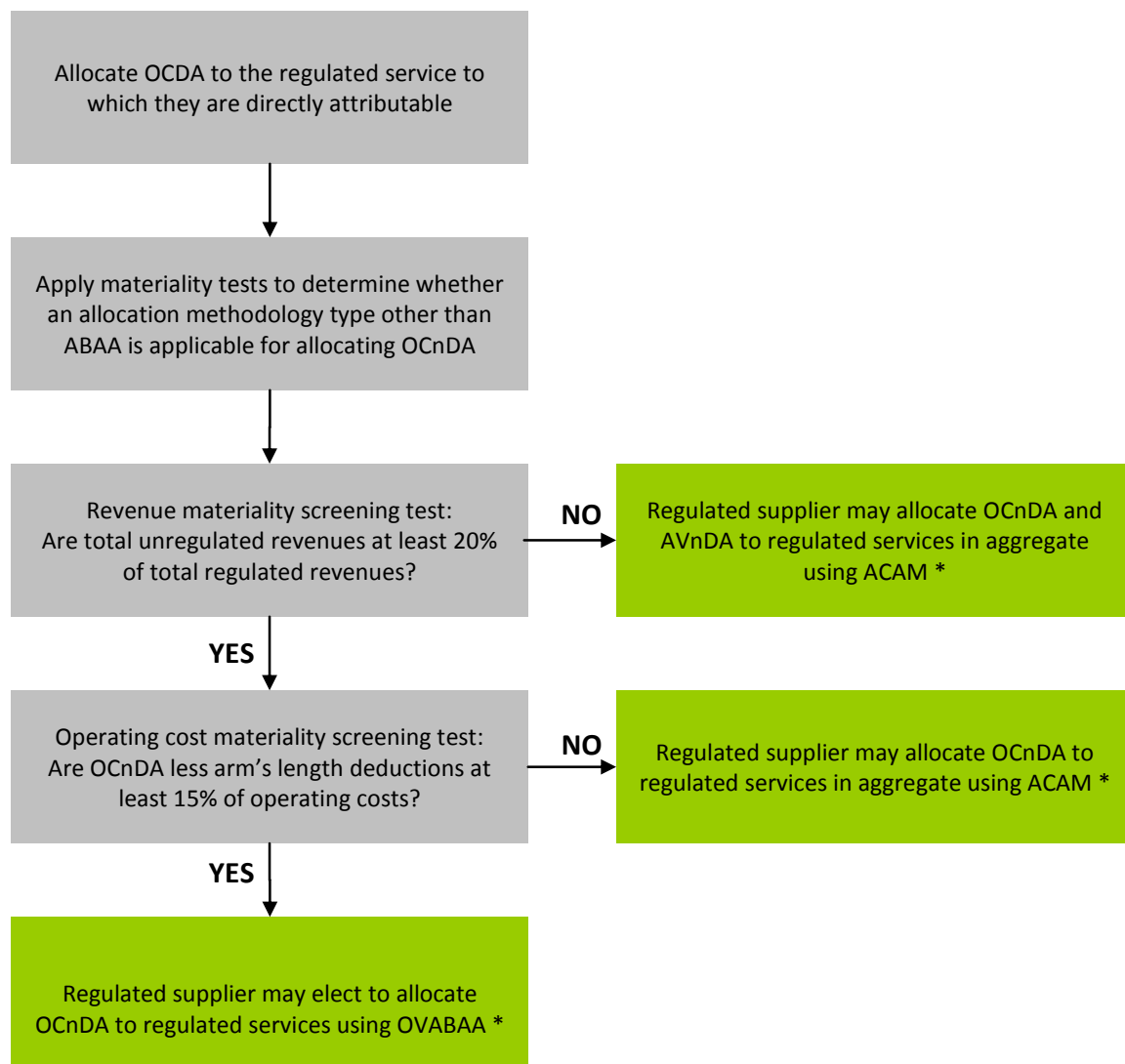
B2.1 Figure B1 below provides an overview of the cost allocation process as set out in clauses 2.1.1 and 2.1.2 of the IM Determinations for EDBs and GPBs respectively.⁴⁹⁷

⁴⁹⁵ This is referred to in the IM Determinations for EDBs and GPBs as the 'cost allocation process'.

⁴⁹⁶ Hereafter, the 'regulated service asset value materiality test' is referred to as the 'asset value materiality test'.

⁴⁹⁷ Commerce Act (Electricity Distribution Services Input Methodologies) Determination 2010; Commerce Act (Gas Distribution Services Input Methodologies) Determination 2010; Commerce Act (Gas Transmission Services Input Methodologies) Determination 2010.

Figure B1 Overview of the Cost Allocation Process for Operating Costs



Note: * Consistent with the arm's-length provision in the operating cost materiality screening test, in the approaches to be applied to OCnDA suppliers may voluntarily make arm's-length deductions relating to OCnDA; at any time a regulated supplier may elect to apply the ABAA to allocate OCnDA. OCDA means operating costs directly attributable; OCnDA means operating costs not directly attributable; AVnDA means regulated service asset values not directly attributable.

B2.2 Following the sequence in Figure B1 the following sets out the steps of the cost allocation process for operating costs-not-directly-attributable ('OCnDA'):

- regardless of what approach is employed to allocate OCnDA, the first step in the cost allocation process is to allocate operating costs directly attributable ('OCDA') to each type of regulated service;
- following this, regulated suppliers must determine which allocation approach to apply when allocating OCnDA;
- regulated suppliers may then elect to allocate OCnDA using the ABAA (further details on this approach are provided in Appendix B4 below); or may use materiality screening tests to determine if they are able to utilise another allocation approach. At all times, the use of a cost allocation approach is subject to the constraint that the allocation across all regulated services

supplied by EDBs or GPBs must be no higher than the allocation resulting from ACAM applied to regulated services in aggregate;

- if EDBs or GPBs decide to apply the materiality screening tests and the revenue materiality screening threshold is not reached or exceeded, those regulated suppliers may apply ACAM to allocate OCnDA and regulated service asset values not directly attributable ('AVnDA') to regulated services in aggregate. Further details on this approach are provided in Appendix B5 below;
- if the threshold specified in the revenue materiality test is reached or exceeded, but the operating costs materiality screening test threshold is not reached or exceeded, regulated suppliers may apply ACAM to allocate OCnDA to the regulated services in aggregate;
- if the threshold specified in the operating cost materiality screening test is reached or exceeded, EDBs or GPBs may elect to apply either the ABAA or the OVABAA;
- under the OVABAA, regulated suppliers form a view on the viability of their current unregulated service(s), based on factors such as prices, demand, quality, etc, and assess whether the ABAA would unduly deter their supply. This assessment can then be used to justify moving away from a cost allocation that would be achieved by the ABAA; and
- as noted above in Figure B1 when applying the ABAA, ACAM and the OVABAA and materiality tests for operating costs, suppliers of regulated services are able to adjust the amount of OCnDA to reflect voluntary 'arm's-length deductions' of costs recovered under arm's-length transactions. Further details on these deductions are set out in Appendix B7.

B2.3 The cost allocation process for regulated service asset values is similar to that for operating costs, except the operating cost materiality screening test is replaced by the asset value materiality screening test. The asset value materiality screening test asks the question: are AVnDA at least 10% of aggregated unallocated closing RAB value for all types of regulated services?

B2.4 Operating cost and asset value materiality screening tests are to be undertaken independently of each other. Further discussion is provided in B3 below.

B2.5 However, consistency in the assessment under the OVABAA across both cost categories is required. Allocations of operating costs, and regulated service asset values allocated to unregulated services should be reduced to the extent necessary to ensure that the provision of these services is no longer unduly deterred.

B2.6 In addition, allocations under the OVABAA are constrained by the requirement that the allocation to the regulated services be no higher than the allocation resulting from ACAM applied to those services in aggregate. Further details on the OVABAA are provided in Appendix B6 below.

- B2.7 The remainder of this appendix sets out the Commission's specific approaches to and the reasons for the implementation of the cost allocation process and other components of the IM.

B3 Materiality Screening Tests

Materiality standard

- B3.1 The materiality thresholds are based on the change in the allocation values that would be required to generate at least a 1% change in total regulated revenues. Such a change in revenues, assuming a constant level and structure of consumption, would translate to a 1% change in charges for regulated services. In practice, thresholds calculated for operating cost and asset value materiality tests are based on a materiality standard of 1-2% in revenue rather than a strict 1%.
- B3.2 Analysis undertaken by the Commission, based on data disclosed as part of the 2009 Electricity Information Disclosure, shows that a 1-2% change in regulated revenues is on average equivalent to a 3-6% change in earnings before interest and tax (EBIT).⁴⁹⁸ The Commission has concluded that a 1-2% change in revenue will be material from a supplier as well as a consumer viewpoint (given that consumers will face this through higher prices).
- B3.3 Submitters argued that a 1% movement in regulated revenue was too low and should be set at 5%, which is the threshold employed in the SSNIP (small but significant and non-transitory increase in price) test used by the Commission.⁴⁹⁹ The Commission has concluded that the 5% is an irrelevant comparator for thresholds used in the materiality tests.
- B3.4 The SSNIP test is used by competition authorities for market definition in competition investigations, such as mergers. It seeks to identify the smallest relevant market in which a hypothetical monopolist can increase the price of its products (often by 5% or 10%), without a significant loss in sales by consumers switching to other products. It seeks to establish whether there is a competitive constraint on hypothetical firms' products.
- B3.5 The SSNIP test is an analytical tool used to inform competition investigations. However, it does not determine the outcome as there are a number of additional considerations to be taken into account. For example, where a firm's product is found to have limited substitutes according to the SNIPP test in the context of a merger, there may be other mitigating factors which mean that actual price increases are less than those implied by the hypothetical test. Alternatively, if other evidence reinforces conclusions drawn from the competition test, mitigating measures would be proposed or a merger application is rejected outright. The application of the threshold therefore

⁴⁹⁸ This analysis was undertaken by comparing earnings before interest and tax (EBIT) with regulated revenue for each EDB disclosing information as part of the 2009 EDB Information Disclosures. For these companies, the median for EBIT as a percentage of regulated revenue was 33%.

⁴⁹⁹ Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 48, paragraph 154.

provides only very limited information about actual price changes that would result from the merger.

- B3.6 The Commission's materiality tests are used in a very different context. Their purpose is to provide a high level screening mechanism to avoid changes in suppliers' cost allocation methodology where this is unlikely to materially move outcomes closer to those produced in workably competitive markets.
- B3.7 Importantly, for GPBs and non-exempt EDBs the Commission sets price-quality paths. Setting a high materiality threshold (such as 5%) may lead to a supplier that is just under the threshold to derive a benefit from a significant uplift in allowed revenue (and profitability). The use of a generous threshold would therefore not only fail to meet the objective of the test but would be in direct conflict with s 52A(1)(d), which requires the Commission to limit suppliers in their ability to extract excessive profits.
- B3.8 Furthermore, Vector's submission on the SSNIP test is not consistent with other submissions made by it relating to materiality:
- in its post-workshop submission, Vector indicated that it considered a 10% change in price would "ensure that static welfare benefits to consumers of regulated businesses exceed the risks of unduly deterring investment in unregulated businesses".⁵⁰⁰
 - in its submission on CPP re-openers, Vector submitted that the AER approach of setting the materiality threshold at 1%, rather than 5% of allowed revenues in the year, "is a materially better approach than the Commission's draft decision as it treats all events equally regardless of the year in which they occurred".⁵⁰¹
- B3.9 The Commission has therefore concluded that 1-2% is an appropriate level for its materiality standard and has not received convincing evidence to indicate that this might be inappropriate. It has therefore set thresholds for each of its materiality screening tests with reference to this standard. Further details on calculations underlying each of these thresholds are set out in the remainder of this section and in Appendix C.

Revenue materiality screening test

Approach

- B3.10 Based on the materiality standard discussed above, the IM provides that the revenue materiality screening test should assess whether revenues received from the supply of all unregulated services ('total unregulated revenue') is at least 20% of revenue received from the supply of all regulated services ('total regulated revenue').⁵⁰²

⁵⁰⁰ Vector Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 43, paragraph 111.

⁵⁰¹ Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 62, paragraphs 238-239.

⁵⁰² The Commission defines total regulated revenue as that received from the provision of electricity distribution services and any other services regulated under Part 4.

Further details on the calculations for setting this threshold are set out in Appendix C.

- B3.11 If total unregulated revenue is less than 20% of total regulated revenue, then EDBs and GPBs can apply ACAM to allocate operating costs and regulated service asset values not directly attributable to regulated services in aggregate.
- B3.12 If total unregulated revenue is equal to or more than 20% of total regulated revenue then EDBs and GPBs have the option to apply the operating costs and/or asset value materiality screening tests. Irrespective of this test, EDBs and GPBs may also opt to apply the ABAA if they wish.

Reasons

- B3.13 The Commission's revenue materiality threshold will be straight-forward to implement using readily available information generated for information disclosure reporting purposes. At the IM (Electricity Distribution Services and Gas Pipeline Services) Workshop, Unison supported the development of the proposed screening tests "mainly because [the screening criteria set out by the Commission are] simple, straightforward, easy to comply with, [and have] low compliance costs because they're available for information disclosure".⁵⁰³
- B3.14 As noted in Section 3.3, the objective of this screening test is to provide for situations where regulated and unregulated services have only a small proportion of their costs in common, and the use of the ABAA is unlikely to move outcomes much closer to those in workably competitive markets.
- B3.15 Although MDL submitted that it "supports the '5% of revenue' materiality threshold provided by the Commission in the Draft Determination document",⁵⁰⁴ GasNet submitted that the threshold should be raised to 10%.⁵⁰⁵ A number of other submitters, however, argued the level of the threshold for the revenue materiality screening test threshold should be increased to 20% (from the 5% value proposed in the Draft Reasons Paper) in order to ensure the application of the 15% operating cost and 10% asset values materiality test thresholds working alongside the revenue test would meet the Commission's assumption of 1% materiality.⁵⁰⁶
- B3.16 The Commission has analysed the way in which the revenue materiality screening test threshold is likely to interact with the other materiality screening test thresholds.

⁵⁰³ This comment was made in the context of the previous nomenclature for the screening tests which were referred to as Box 1 and Box 2. The exact wording from the transcript is: "Unison considers that a screening criteria is absolutely essential and applauds the Commission for its efforts in this regard to try and develop a screening regime, once the Commission is down this path. We think boxes 1 and 2 are right, mainly because they're simple, straightforward, easy to comply with, low compliance costs because they're available for information disclosure." Mr. Gundersen from Kensington Swan representing Unison, Commerce Commission, *Electricity Distribution Businesses and Gas Pipeline Businesses Workshop Transcript*, 24 February 2010, p. 40, lines 28-33.

⁵⁰⁴ Maui Development Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 11, paragraph 9.

⁵⁰⁵ GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010 p. 5, paragraph 17.

⁵⁰⁶ See, for example: Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, pp. 17-18, paragraphs 57-58, pp. 48-50, paragraphs 153-161; PricewaterhouseCoopers made on behalf of 20 Electricity Distribution Services, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 11, paragraph 27.

In doing so, it has analysed the relationship between all materiality test thresholds and the 1-2% materiality standard. As a result, in line with submissions from the Electricity Networks Association and other suppliers, the revenue materiality screening test threshold has been raised to 20%. This ensures consistency with the 1-2% materiality standard. Further details of this analysis and the calculations underlying the setting of thresholds for each materiality screening test are set out in Appendix C.⁵⁰⁷

Operating cost and asset value materiality screening tests

Approach

B3.17 The IM provides that if the revenue materiality screening test threshold is reached or exceeded, EDBs and GPBs may undertake the following materiality tests:

- **operating cost materiality screening test.** This test assesses whether OCnDA,⁵⁰⁸ less arm's-length deductions are at least 15% of operating costs; and
- **asset value materiality screening test.** This test assesses whether AVnDA,⁵⁰⁹ less arm's-length deductions are at least 10% of aggregated unallocated closing RAB value for all types of regulated services.

B3.18 The operating cost and asset value materiality screening tests need to be undertaken independently of each other. This means that if an EDB or GPB opts to apply ACAM for allocating OCnDA (on the basis that the proportion of OCnDA does not reach the operating cost materiality threshold) it can only apply ACAM for allocating operating costs and may not automatically allocate regulated service asset values as well (and vice versa). Similarly, if an EDB or GPB opts for the OVABAA, it can only apply this approach to both OCnDA and AVnDA if the following applies:

- both operating costs and regulated service asset values reach or exceed their respective materiality thresholds; and
- directors certify that a different allocation of operating costs and regulated service asset values than would arise under the ABAA is necessary for the unregulated service to remain viable.⁵¹⁰

⁵⁰⁷ Telecom submitted that the proposed revenue materiality threshold may be comparatively high and that "one solution for this would be to apply the test to expected 'long run' revenue from unregulated businesses, where 'long run' would be measured in relation to the expected life of the investment in that unregulated service." (see Telecom Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010). The Commission's cost allocation process acknowledges the uncertainty in certain phases of a businesses life cycle to avoid unduly deterring investments. Consideration of the expected profit over the life time of an investment would be expected to be incorporated into the OVABAA but a separate test would not be appropriate. Revenue over the lifetime of the investment is therefore not an appropriate measure to be used as part of the revenue materiality threshold test.

⁵⁰⁸ Operating cost means expenditure incurred by the EDB in the supply of any type of regulated service and excludes: a cost that is treated as the cost of an asset by GAAP; amounts that are depreciation, tax, subvention payments, revaluations or an interest expense, in accordance with their meanings under GAAP; and pass-through costs or recoverable costs.

⁵⁰⁹ Regulated service asset values means, in respect of an asset used in the supply of any type of regulated service, unallocated closing RAB value determined in accordance with the IM Determination applicable to that type of regulated service.

Reasons

- B3.19 As discussed above, in selecting the level of the materiality thresholds, the Commission has used the percentage change in regulated revenue to set the materiality thresholds. The underlying calculations and assumptions for these thresholds are set out in Appendix C.
- B3.20 A number of EDB and GPB submitters argued that a third materiality test should be added. This would involve assessing whether the gross profit of each unregulated service is greater than 10% of the suppliers' total gross profit.⁵¹¹ Reasons given for adding this additional materiality screening test included that "while revenue and operating cost screening criteria are a good first step, a screening criterion based on the gross profit of each unregulated business unit is materially better at approximating the level of common costs that the associated service would bear in a workably competitive market".⁵¹²
- B3.21 The revenue and operating cost information that is used in the two materiality tests that form part of the IM are linked to the gross profits tests proposed by submitters. Gross profits are defined as the difference between revenue and directly attributable operating costs.
- B3.22 The materiality tests are designed to provide a straightforward-to-implement screening mechanism. Nonetheless, consistency between the materiality thresholds used in the different tests needs to be ensured so that a gross profit materiality test is also consistent with the Commission's chosen materiality standard of 1-2% effect on price.⁵¹³ The Commission does not have access to information that could be used for determining a threshold for gross profit which is consistent with those already calculated for revenue, operating costs and asset values. Given the linkage between the three financial measures, setting a threshold for gross profit that is inconsistent with the related measures risks undermining the purpose of all materiality tests.⁵¹⁴

⁵¹⁰ The definition of the term 'directors' includes 'partners' of partnerships, 'general partners' of special partnerships and for any other body corporate or body which is incorporated, a person occupying a position in the body that is comparable with that of a director of a company. For consumer-owned EDBs, this would include either a 'trustee' or a 'member of the committee of shareholders'.

⁵¹¹ See, for example: Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 13, paragraph 43 and Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 33-34, paragraphs 129-130; pp. 11-13, paragraphs 37-44.

⁵¹² Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 13, paragraph 43.

⁵¹³ The need for consistency was the basis of submissions from suppliers that the revenue materiality threshold needed to be raised to 20%. (See Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 18, paragraph 57).

⁵¹⁴ Vector submitted that the gross profit materiality threshold should be set at 10% of total gross profits because "10% aligns with the asset related threshold given both gross margins and asset costs assess the non-operating cost component of building block revenues" (see Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 34, paragraph 130). The Commission considers, however, that the rationale suggested by Vector does not offer an adequate explanation regarding the link between the gross profit threshold and the Commission's 1-2% materiality standard. (See Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 314, paragraph 130).

- B3.23 Furthermore, basing a materiality test on gross profit is likely to increase uncertainty relative to a situation where materiality tests for revenue and operating costs are used separately (i.e. the Commission's approach). Financial measures such as operating costs and revenue vary over time. When the two measures are used in combination to calculate total gross profits this variation can be expected to be greater than when each measure is used in isolation. Similarly, the gross profit of unregulated services may be expected to fluctuate over time.
- B3.24 The use of a simple gross profit threshold would therefore increase the uncertainty of the materiality test both for suppliers and consumers. In particular, the snapshot of data relevant to a gross profit materiality test may reflect a contribution of the unregulated services to total gross profit that is atypically high or low and hence not representative of the longer-term gross profits. The test may therefore fail to identify situations where the use of ACAM may be appropriate.
- B3.25 Reducing the uncertainty inherent in the test would require adding additional complexity to the test (such as measuring gross profits over a longer period of time to reduce volatility).⁵¹⁵ The materiality tests are designed to provide a straightforward and easily applicable 'broad brush' to filter out situations where the use of ACAM may be permissible. Given this, and in the absence of appropriate verification that tests have been applied correctly, such additional complexity would not be warranted.⁵¹⁶
- B3.26 The Commission therefore concludes that a test based on gross profit is inappropriate and that information on profit requirements of individual unregulated services (alongside other information) should only form part of assessments undertaken to allocate costs using the OVABAA. Under this approach, the question is not one of materiality but one of how much CnDA each unregulated service is able to bear.⁵¹⁷

⁵¹⁵ Submitters have also recognised the issues involved with using profits (albeit in the context of commenting on Boxes 1 and 2 of the CAMSC). At a Commission workshop a participant commented that there is likely to be difficulty with "trying to assess what's a commercially reasonable level of profit and how that even gets measured". (See Mr Shelley from CRA representing Unison, Commerce Commission, *Input Methodologies Electricity Distribution and Gas Pipelines Workshop Conference Transcript*, 24 February 2010, p. 30, lines 26-27).

⁵¹⁶ Submitters also argued that a materiality test based on gross profit would not be circular as the Commission suggested in its Draft Reasons Paper (see Commerce Commission, *Input Methodologies (Electricity Distribution Services) Draft Reasons Paper*, 18 June 2010, p. 85, paragraph 3.4.17) because it would be calculated based on gross profits, i.e. revenue less directly attributable costs (see Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 12, paragraph 40), and that in borderline cases, application of a gross profit materiality test would be "less administratively expensive" for suppliers than applying the OVABAA. (See Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 34, paragraph 129). The Commission considers that the inherent uncertainty of a materiality test based on gross profit as outlined in the paragraphs above outweighs these considerations.

⁵¹⁷ Note also that in many cases application of the OVABAA will involve an allocation of some shared costs to the regulated services, whereas, if a gross profit materiality test was used, the accounting methodology used would be ACAM so all shared costs would be allocated to the regulated services.

B4 Accounting-Based Allocation Approach

Approach

- B4.1 As discussed in Section 3.3, the IM requires that, where possible, cost and asset allocators are to be based on current ‘causal’ relationships. These are defined by the IM as those which existed during the 18 months terminating on the last day of the disclosure year in respect of which the allocation is being carried out and include:
- in relation to asset values and regulated service asset values, a circumstance in which a factor influences the utilisation of an asset within this period; and
 - in relation to operating costs, a circumstance in which a cost driver leads to an operating cost being incurred within this period.
- B4.2 Additionally, where it is not possible to identify current ‘causal relationships’ and proxy allocators need to be used, EDBs and GPBs must provide a rationale for the selection of these and their associated allocator metrics as part of the information provided to the Commission under either information disclosure regulation or as part of a CPP proposal.
- B4.3 As discussed in Appendix B2 above, at all times, use of the ABAA is subject to the constraint that the allocation across all regulated services supplied by the EDB or GPB must be no higher than the allocation resulting from ACAM applied to those services in aggregate.

Reasons

- B4.4 A causal relationship reflects current factors that lead to these costs being incurred. In relation to capital costs, causal relationships reflect the current factors which influence the utilisation of assets. Regulated service asset values allocated based on this utilisation in turn determine how capital costs are allocated.
- B4.5 A number of regulated suppliers argued that the 18 month time frame for a causal relationship should be extended to 24 months for the following reasons:
- “it aligns with, and draws from, annual information disclosure reporting”⁵¹⁸;
 - “lower compliance costs”⁵¹⁹; and
 - “EDBs / GPBs are characterised by long-lived assets and changes tend not to occur rapidly”.⁵²⁰

⁵¹⁸ Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, 9 August 2010, pp. 37-38, paragraph 148.

⁵¹⁹ Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, pp. 23-24, paragraph 73.

⁵²⁰ Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, 9 August 2010, pp. 37-38, paragraph 148.

- B4.6 The Commission has concluded that a 24 month time frame would be too long for capture a current causal relationship. A time frame up to and including 18 months will ensure that causal relationships are current. The Commission has chosen an 18 month time frame because this period ensures that EDBs and GPBs are not required to reassess ‘causal relationships’ annually, but also ensures that current relationships are sufficiently reflective of actual operational conditions to which the cost allocation applies. The Commission has also chosen 18 months, rather than a time frame aligning with other reporting periods (i.e. 12 months) because there may be situations where, due to information availability or the compliance costs involved in the collection of information (such as the cost of conducting a new sampling study) it may not be possible for suppliers to recalculate metrics for cost and/or asset allocators each disclosure year.
- B4.7 Practical examples of causal relationships used as cost allocators which fit the Commission’s definition might include:
- the number of staff hours recorded against each service during the 18 months recorded on timesheets; and
 - the average number of installation connection points (‘ICPs’) split between electricity distribution services and gas pipeline services over the previous 12 months.⁵²¹
- B4.8 In some circumstances quantifiable causal relationships may not exist. Where this happens, EDBs and GPBs must use quantifiable proxy relationships instead and proxy cost and asset allocators based on these relationships should be applied. Where such proxy allocators are used, EDBs and GPBs must justify their use. Metrics used when applying proxy cost and asset allocators should also be calculated using relevant data from the same 18 month period as the metrics used for causal cost and asset allocators.
- B4.9 Examples of proxy cost and asset allocators include revenue, staff numbers, and balances of CDA allocated (i.e. use of CDA as a proxy for allocations of costs which are not directly attributable).
- B4.10 Analogous to cost and asset allocators based on causal relationships, proxy cost and asset allocators should be based on factors in existence during the same 18 months ending on the last day of the most recent disclosure year.

B5 Avoidable Cost Allocation Methodology

Approach

- B5.1 The IM provides that in certain circumstances an allocation using the Avoidable Cost Allocation Methodology (ACAM) may be appropriate as part of the cost allocation process. One implementation of the ACAM methodology is set out in a handbook

⁵²¹ This example has been included to clarify that allocators may be calculated over any period up to 18 months ending on the last day of the disclosure year in which the allocation is carried out.

that forms part of the information disclosure requirements for EDBs under Part 4.⁵²² For GPBs this approach is not mandatory but the consultation process revealed that GPBs endorse the outcomes achieved with the ACAM approach.⁵²³

B5.2 The requirements of the IM mean that the ACAM rules used under the old Part 4A apply to both EDBs and GPBs through wording inserted into the IM Determination, subject to the following modifications:

- the application of ACAM needs to be undertaken for all regulated services in aggregate, and not separately for electricity distribution, gas distribution or gas transmission services; and
- the exemption in the handbook which provides that if the other (i.e. unregulated) services account for less than 5% of all of the regulated supplier's RAB and revenues in a particular financial year, then it can allocate the *total* costs of the other services to the regulated services,⁵²⁴ will not apply in the cost allocation IM.

Reasons

B5.3 Where a regulated supplier provides more than one type of regulated service, the application of ACAM to each type of regulated service individually may result in shared costs being double counted and hence are recovered more than once.⁵²⁵ This results in none (or only very few) of the benefits of efficiency gains that arise in the provision of regulated services being shared with consumers of regulated services, even in the longer-term.⁵²⁶ To prevent this from happening, a constraint applies on the use of ACAM. This constraint provides that the allocation across all regulated services supplied by the EDB or GPB must be no higher than the allocation resulting from ACAM applied to those services in aggregate. The effect of this constraint will be reflected annually in information disclosed by regulated suppliers under ID.

⁵²² See Commerce Commission, *Regulation of Electricity Lines Businesses Information Disclosure Regime Electricity Information Disclosure Handbook*, 31 March 2004 (as amended 31 October 2008).

⁵²³ See also the discussion in paragraph 3.2.35.

⁵²⁴ Commerce Commission, *Regulation of Electricity Lines Businesses Information Disclosure Regime Electricity Information Disclosure Handbook*, 31 March 2004 (as amended 31 October 2008), p. 8, paragraph 2.4.1.

⁵²⁵ Suppliers acknowledge that where a supplier owns more than one regulated business a SAC approach (i.e. ACAM) as currently applied may result in shared costs being double counted. See, for example: PricewaterhouseCoopers made on behalf of 19 Electricity Distribution Businesses, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009, p. 7, paragraph 12.

This occurs if the EDB supplies two or three types of regulated services, and applies ACAM to each type of service individually. To the extent that prices were set to recover those costs under price-quality regulation, this is likely to result in excessive profits, which would be inconsistent with s 52A(1)(d). Similarly, if profitability were monitored under information disclosure regulation with costs allocated on such a basis, the presence of the excessive profits would be masked, which would not be consistent with s 53A.

⁵²⁶ These outcomes differ from those that are likely to be produced by other suppliers regulated under Part 4, more specifically airports. The regulated and unregulated services offered by airports are complementary in demand (i.e. consumer demand for a service will rise if the price of a complement falls, and conversely, the quantity demanded will drop if the price of a complement increases.) In practice, this interrelatedness means that, in deciding what share of costs to allocate to the regulated services (and hence what prices to set for those services), airports have the incentive to take into account the effect their decision is likely to have on the demand for both regulated and unregulated services. Incentives to allocate all shared costs to regulated services may also be counteracted to some degree if consumers are able to exercise countervailing power. EDBs' and GPBs' consumer bases tends to be highly diverse and fragmented with limited evidence of countervailing power that might help move towards a cost allocation consistent with workably competitive market outcomes.

However, to the extent that improved cost sharing or mergers and acquisitions result in increased efficiencies over time, these are only shared with consumers as part of starting price adjustments or at the reset of the CPP.

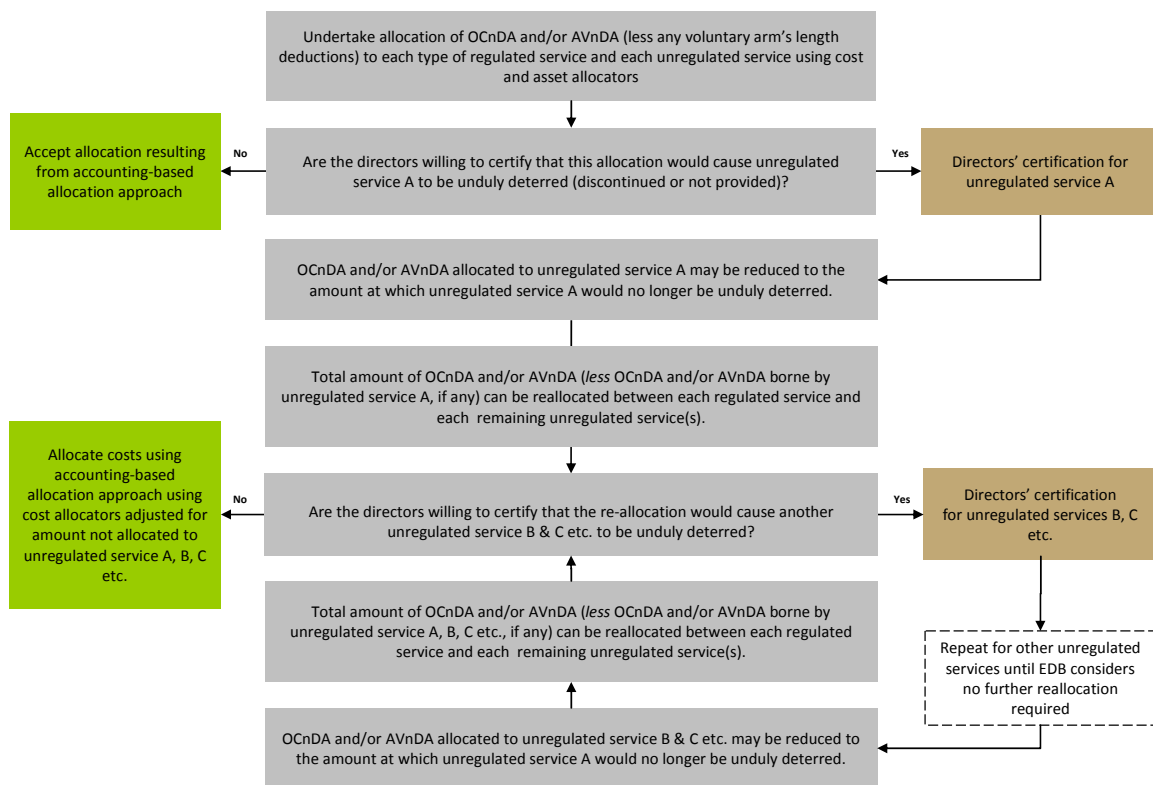
- B5.4 The implication of the 5% threshold exemption in the existing Electricity Information Disclosure Handbook, as defined in paragraph B5.1, is that where regulated services are under this threshold, an EDB or GPB can allocate not only all the shared costs to the regulated services, but all the costs that are directly attributable to the unregulated services as well. The exemption therefore leads to consumers of regulated services not only paying for all the shared costs incurred in the provision of regulated services, but also the cost of the provision of the unregulated services which they do not consume (or if they do consume, they pay for it more than once, the first time through the price paid to the EDB and GPB and again through the price paid for the unregulated services). Charging the total cost incurred in a service more than once would lead to above normal profits without the EDB and GPB needing to invest or innovate for such a level of profitability contrary to s 52A(1)(d). This exemption will not therefore apply under the cost allocation IM.

B6 Optional Variation to the Accounting-based Allocation Approach

Approach

- B6.1 As discussed in Section 3.2, in workably competitive markets cost-bearing outcomes often vary over time. The IM needs to be sufficiently flexible to ensure that investments would not be unduly deterred. In practice the Commission seeks to ensure that investments in unregulated services are able to proceed if they would also proceed in similar circumstances in workably competitive markets. Figure B2 illustrates the OVABAA.

Figure B2 OVABAA



Note: OCnDA means operating costs not directly attributable; AVnDA means regulated service asset values not directly attributable.

B6.2 Following the steps in Figure B2 the OVABAA is as follows:

- either or both of OCnDA and AVnDA represent the starting point for the OVABAA. As discussed in Appendix B2, prior to carrying out any allocation, EDBs and GPBs may adjust OCnDA and AVnDA for arm's-length deductions;
- the EDB or GPB allocates costs using the ABAA. It then forms a view on the viability of its unregulated service(s) based on factors such as prices, demand, quality, etc.;
- this assessment may lead the EDB or GPB to conclude that the investments in an unregulated service (in Figure B2, service A) would be unduly deterred, i.e. solely as a result of an allocation to the unregulated service either or both OCnDA and AVnDA, the costs to be borne by that unregulated service would cause that service to be discontinued or not provided;
- if the EDB or GPB's assessment shows that this is not the case, the amount of shared costs allocated to each type of regulated service and to unregulated services in aggregate should be equal to that calculated using the ABAA;
- however, if the assessment shows that investment would be unduly deterred and directors are willing to provide a certification to the Commission which confirms this, the EDB or GPB may reduce the allocation of shared costs to the unregulated service;

- reductions in costs allocated to that service should be made only to the extent necessary to ensure that the investment in that service is no longer unduly deterred. As a minimum, the unregulated service has to bear the cost allocation that would result from applying ACAM;
- the residual costs, which are no longer allocated to unregulated service A, are then reallocated to the remaining regulated and unregulated services, using the same set of cost allocators as used in the first allocation. In practice, this involves grossing up the unallocated share of costs by adjusting the cost allocators to reflect the cost no longer borne by unregulated service A. The allocation of this residual operating cost and/or regulated service asset value to the other regulated and unregulated services is then undertaken using these adjusted cost allocators. To reduce double counting of costs shared between regulated services, the allocation to the regulated services in aggregate should be no higher than the allocation implied by ACAM;
- if at this point the EDB or GPB considers that there are no further investments in other unregulated services that are being deterred solely as a result of applying this first allocation, the process stops;
- if the regulated supplier considers that further unregulated services are being unduly deterred, and it provides a directors' certificate to the Commission accompanied by relevant evidence; and
- the EDB or GPB may repeat the process until no investments are unduly deterred (in Figure B2, service B & C etc.).⁵²⁷

B6.3 As discussed in Appendix B2 above, while the cost allocation process for deciding how to allocate costs has been described separately for OCnDA and AVnDA, consistency in the assessment under the OVABAA across both of these is required. This is to ensure that the combined reduction in OCnDA and AVnDA allocated to unregulated services (where both assets and operating costs are shared) occurs only to the extent necessary to ensure that investments are no longer unduly deterred.

B6.4 For example, assume for purely illustrative purposes that the assessment is based on a single profitability measure (e.g. EBITDA or ROI). A level of profitability which ensures that investments are no longer deterred could be achieved in several ways, depending on whether operating costs, assets, or both are shared:

- OCnDA may be reallocated to other regulated and unregulated services up to the point where the investments become viable. In this case, the OVABAA must not be undertaken for regulated service asset values since a level of

⁵²⁷ At the start of applying the OVABAA, EDBs and GPBs may also consider that the investment in more than one unregulated service might be unduly deterred. In this instance EDBs and GPBs may begin by applying the OVABAA to that service for which the effect of applying the ABAA has the most significant effect, and then move to that service with the second biggest effect, etc. In practice, the Commission expects that the order in which the OVABAA is undertaken should not affect the outcome. Note also that the OVABAA may involve the EDB or GPB providing information on individual unregulated services, not only information on all its unregulated services in aggregate. That said, the approach is entirely voluntary on the part of the EDB and GPB, and any information that the Commission agrees to be commercially sensitive will not be publicly released.

profitability sufficient to render the investment viable has been achieved solely through the application of the OVABAA applied to operating costs;

- AVnDA may be reallocated to other regulated and unregulated services up to the point where the investments become viable. In this case, the OVABAA must not be undertaken for operating costs since a level of profitability sufficient to render the investment viable has been achieved solely through the application of the OVABAA applied to regulated service asset values; and
- a combination of both OCnDA and AVnDA may be reallocated. However, the profitability resulting from both these reallocations must be no higher is needed to ensure that the investments become viable.

Reasons

B6.5 The OVABAA enables EDBs and GPBs to apply their own understanding of the current and future prospects for the unregulated services in making assessments as to whether investments are unduly deterred. This approach also provides significant flexibility to adapt the allocation to the specific circumstances of an EDB and GPB.⁵²⁸

Directors' certifications

Approach

B6.6 The IM provides that:

- EDBs and GPBs must justify the use of an OVABAA using directors' certifications;
- alongside the directors' certification, EDBs and GPBs may need to provide appropriate supporting information to the Commission; and

⁵²⁸ Telecom submitted that the term 'efficient' should be inserted into the phrase 'deter investment' to make the OVABAA only available in connection with efficient investment (Telecom Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p.19, paragraph 60). The Commission does not consider that addition of this term adds anything to the OVABAA at a practical level. Telecom also argued that limitations should apply to the extent to which the OVABAA should apply to investments in fibre-optic telecommunications infrastructure (See Telecom Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p.19, paragraph 60). However, suppliers disagreed, and considered that certain business types should be excluded from the OVABAA. For example, NZIER on behalf of AECT submitted that investments in the Ultra-fast Broadband Initiative should be treating according to ACAM (Auckland Energy Consumer Trust, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 3), and Castalia, on behalf of Genesis submitted that investments in the use of electricity infrastructure to distribute broadband should be dealt with on a case by case basis under the OVABAA (Genesis Energy Limited, *Cross Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Attachment: Castalia Strategic Advisors, Expert Report: prepared for Genesis Energy Ltd*, 2 September 2010, p. 7, paragraph 42). The Commission notes that different types of bidders are part of the UFB bidding process and consider it commercially viable to be so. It is outside the Commission's remit to engage in industrial policy in relation to these services services and the OVABAA provides sufficient flexibility for EDBs and GPBs choosing to provide such services.

- where EDBs and GPBs make arm's-length deductions prior to materiality screening tests, EDBs and GPBs must provide an additional directors' certificate to the Commission regarding the amount of these deductions.

B6.7 While the cost allocation IM Determination identifies aspects of the IM that would require directors' certification, the form of such a certification would likely be specified in information disclosure requirements set under s 52P of the Act.⁵²⁹

Reasons

B6.8 EDBs and GPBs have access to the most directly relevant information on which to base assessments relevant to the OVABAA, including details of contracts and the extent to which they comply with the definition of arm's-length transactions. As such, the Commission considers that it is not necessary to provide a detailed set of criteria to be used by an EDB or GPB to demonstrate the appropriateness of its claims, or which can be used by the Commission to objectively assess the claim.

B6.9 However, the decision by EDBs or GPBs to apply an OVABAA (and the cost allocation that results from it) must be verified. The Commission therefore requires EDB and GPB's directors to certify the appropriateness of the relevant decision.

B6.10 Submitters argued the use of the word 'solely' in the definition of 'unduly deterred' and inclusion in the directors' certification creates too high a threshold and that this term should be softened and changed to 'significant' or 'a material adverse impact'.⁵³⁰

B6.11 The use of the term 'solely' in the definition of 'unduly deterred' is not intended to mean that the cost required to be borne as a result of an allocation is the *only* factor that results in an unregulated service being discontinued or not provided. It is intended to capture situations where, 'all other things being equal', the pivotal reason an unregulated service would be discontinued or not undertaken is its inability to bear the shared costs allocated to it as a result of applying the ABAA. In other words, after other factors have been taken into account, the amount of shared costs implicitly allocated to an unregulated service using the ABAA are the pivotal factor leading directors to discontinue or not provide the unregulated service.

B6.12 The Commission's definition of 'unduly deterred' (as per the IM Determination) does not introduce an unknown or unusual level of complexity for directors. Judgement is commonly exercised in commercial situations that have complexities

⁵²⁹ Note, where allocations are being undertaken as part of a CPP application, and no disclosure has previously been made pursuant to an ID determination, the form of such certification and required associated information disclosures will be prescribed as part of rules for CPP applications and transition tables for cost allocation disclosure.

⁵³⁰ Vector submitted that "the Commission's requirement (that the investment would be unduly deterred 'solely' because of the cost allocation approach) is an unreasonably high threshold" which "ignores the realities of business decisions where this will be one of a multitude of factors which together may tip the balance against investment" and should also be considered "in light of the fact a certification from a Director is a significant document and carries with it penalties if the Director provides false or negligent information" (see Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 22, paragraph 90). ENA also submitted that "The common cost allocation methodology would be materially better if the test of 'undue' deterrence turned on whether the proportion of costs (not directly attributed) that is allocated to the supply of goods or services in the competitive market must cause a **material adverse impact** on the regulated supplier's competitive conduct in the market" (emphasis added) (see Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 40, paragraph 142).

analogous to those inherent in the definition of ‘unduly deterred’. Furthermore, of the factors directors are required to take into account when approving a business plan, the shared costs borne are readily forecastable.

- B6.13 A relaxation of this standard to another term such as ‘significant’ or ‘a material adverse impact’ would decrease the clarity provided by the present definition and make the decision to use the OVABAA overly subjective and uncertain for suppliers and consumers.
- B6.14 In addition, information supporting the directors’ decision will probably be requested by the Commission through s 53B(1)(c). The purpose of this information request would be to monitor compliance with the IM and to assess how the OVABAA has been applied. Consequently, it is not necessary for this information to be made publicly available.⁵³¹

B7 Adjustments for Arm’s-length Transactions

Approach

- B7.1 As discussed in Appendix B2, the IM provides for voluntary deductions from OCnDA and AVnDA for:
- operating costs incurred by an EDB or GPB in the supply of unregulated services that have been recouped in an arm’s-length transaction; and
 - regulated service asset values in respect of assets used by an EDB or GPB in the supply of unregulated services for which a recoupment of capital costs has been made by the EDB or GPB in an arm’s-length transaction.⁵³²
- B7.2 The definition for arm’s-length that applies as part of this IM is that contained in clause 1(2) of schedule 3 of the Electricity Industry Act 2010.⁵³³ Compliance with

⁵³¹ A number of suppliers suggested other modifications to the directors certification process. For example, PwC argued that directors should be able to provide a statement at the time the certification was made about the number of years for which the OVABAA would apply, this period being up to 10 years (PricewaterhouseCoopers made on behalf of 20 Electricity Distribution Services, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 11, paragraph 29). ENA argued that “an alternative to annual certification would be the ability of a Directors’ certification to support a medium term commitment not to allocate shared costs to a particular business (Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 21, paragraph 63). Unison also submitted that “The Commission must apply the resulting cost allocations in determining DPP/CPP paths” (Unison Networks Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 22-23, paragraph 72). The OVABAA addresses the issue of unduly deterring investments. The Commission considers this to be a short term issue and thus, *prima facie* directors’ certification should be made on an annual basis. This will ensure that certifications are current and accurate and provide transparency. Appendix B8 explains the application of the IM as part of default/customised price-quality regulation.

⁵³² For the purposes of clarity, for a transaction to be defined as ‘arm’s-length’, it does not include terms that parties in their respective positions would usually omit, and does not omit terms that parties in their respective positions would usually include if they were 1) connected or related only by the dealing in question, 2) acting independently and each acting in their own best interests. A number of submitters considered that arm’s-length deductions for operating costs, as included in the Draft Determination, should be voluntary rather than mandatory (see, for example: Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 23, paragraph 70; Powerco Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 26, paragraph 94). These deductions are intended to be voluntary and the wording of definitions in the IM Determination has been updated to clarify this.

arm's-length transactions is verified through a directors' certification, and where required by the Commission, further supported by additional information.

- B7.3 These deductions will allow suppliers to deduct operating costs and asset values which relate to amounts recovered in arm's-length transactions from unallocated balances of OCnDA and AVnDA. The implications of these deductions are as follows:
- any deductions made will directly reduce the balance of OCnDA and/or AVnDA and will reduce these balances for the purposes of establishing whether the supplier meets the materiality threshold for operating costs and asset values; and
 - even where the OCnDA and/or AVnDA reach or exceed the materiality threshold, the proportion of costs recovered through arm's-length arrangements does not have to be allocated using an ABAA (although the implicit allocation achieved should be equivalent to this).

Reasons

- B7.4 The definition in the Electricity Industry Act 2010 provides appropriate guidance on arm's-length transactions.
- B7.5 As discussed in Section 3.3, the IM provides that actual operating and capital costs⁵³⁴ incurred in the supply of other regulated and unregulated services and recovered through revenue from arm's-length transactions, can be deducted from the operating costs and regulated service asset values that are subject to the materiality screening tests.
- B7.6 Such deductions are likely to increase the chances that either or both an EDB's and a GPB's OCnDA and AVnDA are below their materiality thresholds. Furthermore, even where the OCnDA or AVnDA exceed materiality thresholds after such deductions are made, they are likely to reduce the proportion of costs that have to be allocated using the ABAA as costs for which arm's-length deductions have been made are effectively removed from the pool of cost to be allocated using the ABAA.
- B7.7 For example, if an EDB or GPB recovers most OCnDA shared with unregulated services through arm's-length transactions, it would not have to apply the ABAA for operating cost. Where an EDB or GPB recovers some OCnDA through arm's-length transactions but still exceeds the operating cost materiality test threshold, the costs recovered under the arm's-length deduction will not be included in the OCnDA which must be allocated using the ABAA. The arm's-length deduction made for these costs will represent the costs which are allocated to regulated services. In order to be consistent with the definition of arm's-length transactions in the Electricity Industry Act 2010, it is expected that the cost allocation and recovery from the unregulated service is similar or greater than that resulting from the ABAA.

⁵³³ Prior to the Electricity Industry Act 2010 coming into force, this definition was contained in clause 1(2) of Schedule 1 of the Electricity Industry Reform Act 1998 (EIRA). The EIRA was repealed from 1 November 2010.

⁵³⁴ Capital costs means either or both return on or of regulated service asset values.

- B7.8 In the Draft Reasons Paper, the Commission proposed to allow arm's-length deductions only for operating costs. However, Vector submitted that the IM should also allow similar deductions to be made for assets valued under arm's-length transactions. In doing so, it submitted that "it is unlikely that parties to a long-term contract in workably competitive markets would have negotiated and agreed different arrangements for operating and asset-related costs".⁵³⁵
- B7.9 In the interest of consistency, the Commission has decided to allow an equivalent voluntary arm's-length deduction for regulated service asset values in respect of assets for which capital costs have been recovered in an arm's-length transaction. If a regulated supplier elects to carry out this deduction, however, they will need to disclose details of:
- which assets in the RAB arm's-length deductions relate to; and
 - the amount of each deduction made to regulated service asset values for each asset.

B8 Application of the IM

Information disclosure

- B8.1 Pursuant to s 52S, suppliers must apply the cost allocation IM when disclosing information in accordance with information disclosure requirements under subpart 4 of Part 4. Both exempt and non-exempt EDBs and GPBs will be required to disclose information in accordance with these requirements.
- B8.2 This information is required to provide interested persons with sufficient information to assess whether the Part 4 Purpose is being met. For example, information disclosed should provide enough information to interested parties to assess whether regulated suppliers have shared with consumers the benefits of efficiency gains in the supply of the regulated service under s 52A(1)(c). Information disclosed will also assist the Commission in monitoring compliance with the cost allocation IM, and in turn will assist the review of this IM required by s 52Y(1) of the Act.
- B8.3 The following types of information may be required under information disclosure:
- a transparent description of the cost and asset allocation process including identification of costs and assets to be allocated, cost and asset allocators, the rationale for selecting one causal allocator over another, one allocator metric over another, and for selecting a proxy allocator over a causal allocator, pursuant to s 53B(1)(a);
 - for each operating cost and asset category, the dollar value allocations of OCnDA and AVnDA split by the different types of regulated services, and between regulated and unregulated services (in aggregate) that result from applying the cost allocation IM;

⁵³⁵ Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 38-39, paragraphs 150-151.

- information detailing the effect of any changes to cost allocation methodologies; and
 - information supporting the outcomes of the materiality screening tests.
- B8.4 As discussed in Section 3.3 above, after a merger or acquisition EDBs and GPBs should continue to report actual costs under information disclosure.
- B8.5 In order to fulfil its monitoring role, the Commission is likely to require additional information annually on the underlying assumptions and outcomes relating to the cost allocation IM, including:
- additional information on the split of cost allocator metrics between electricity distribution services, gas distribution services, gas transmission services and between regulated and unregulated services (in aggregate);
 - for each cost and asset allocator used, the dollar value allocations of OCnDA and AVnDA split by the different types of regulated services, and between regulated and unregulated services (in aggregate) that result from applying the cost allocation IM;
 - information supporting arm's-length deductions relating to asset values to which asset deductions relate as well as the amount of each deduction made to regulated service asset values for each asset;
 - information supporting arm's-length deductions relating to operating costs to which operating cost deductions relate as well as the amount of each deduction made for each operating cost; and
 - any directors' certifications made in relation to the application of the OVABAA.
- 9.6.21 Suppliers may also need to provide information that directors relied upon in deciding to make these certifications. This may include board papers, key performance indicators and the supporting information.
- B8.6 Further details of the types of information that are likely to be required are set out in a worked example in Appendix D.
- B8.7 This appendix has provided additional detail on some likely information disclosure requirements under Part 4, as the new information disclosure requirements for EDBs and GPBs have not yet been drafted. Until these come into force, information will still be disclosed under the existing requirements.
- B8.8 Any information that the Commission agrees is commercially sensitive will not be publicly disclosed.⁵³⁶

⁵³⁶ Suppliers submitted that “any information that the Commissions seeks as part of information disclosures should be limited to that which is relevant to regulated services. If information related to non regulated services is disclosed it will expose potentially commercially sensitive information to the markets where those businesses compete. It will also give the Commission access to information on services which falls outside the scope of services regulated under Part 4.” (See PricewaterhouseCoopers made on behalf of 20 Electricity Distribution Services, *Submission on the Draft Input*

Default/customised price-quality regulation

DPPs

- B8.9 The cost allocation IM will only apply to DPPs indirectly via information disclosed as part of information disclosure regulation. Due to timing issues surrounding the development of updated information disclosure requirements for EDBs and GPBs, information required for any initial starting price adjustments of the DPP may need to be requested separately under s 53ZD.
- B8.10 As discussed above in Section 3.3, the price-quality path set by a DPP or a CPP will not be re-opened during that regulatory period for non-exempt EDBs and GPBs involved in a merger or acquisition with other services regulated under Part 4. The Commission has consulted separately on how starting price adjustments for DPPs might be implemented, and how efficiency gains (including those from mergers or acquisitions) could appropriately be shared with consumers when making those adjustments. As part of these consultations, it released a discussion paper in August 2010.⁵³⁷ Further consultations on issues relating to starting price adjustments will take place in 2011.
- B8.11 In addition, the DPP will not be reopened during a particular regulatory period in cases where a directors' certification has been provided as part of the OVABAA, but the circumstances of the unregulated services to which this relates have changed (e.g. they have become significantly profitable or unprofitable).

CPPs

- B8.12 CPP proposals must comply with the cost allocation IM. This section sets out the Commission's approach to applying the cost allocation IM to CPP proposals.
- B8.13 EDBs and GPBs must divide operating costs in each CPP opex category into those which are directly attributable and those which are not directly attributable.⁵³⁸ Similarly, EDBs and GPBs must divide regulated service asset values in each CPP asset category into those which are directly attributable and those which are not directly attributable.
- B8.14 Figure B3 provides an overview of time periods relevant to CPP applications. These are:

Methodologies (Electricity Distribution Businesses) Determinations and Draft Reasons Papers, 9 August 2010, p. 13, paragraph 35; and comments from GasNet (GasNet Limited, *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper*, 9 August 2010, p. 8, paragraphs 27-28). Under s 53D a regulated supplier can be required to disclose information to the supply of unregulated services (in aggregate) for the purpose of monitoring compliance with information disclosure regulation. All information disclosed under ID requirements is made available publicly. Any additional information requested by the Commission in order to fulfil its monitoring compliance role is requested pursuant to the Commission's authority under s 53ZD. Under this section, information is made available to the Commission only and not for the purpose of allowing interested parties to assess whether the Part 4 purpose is being met.

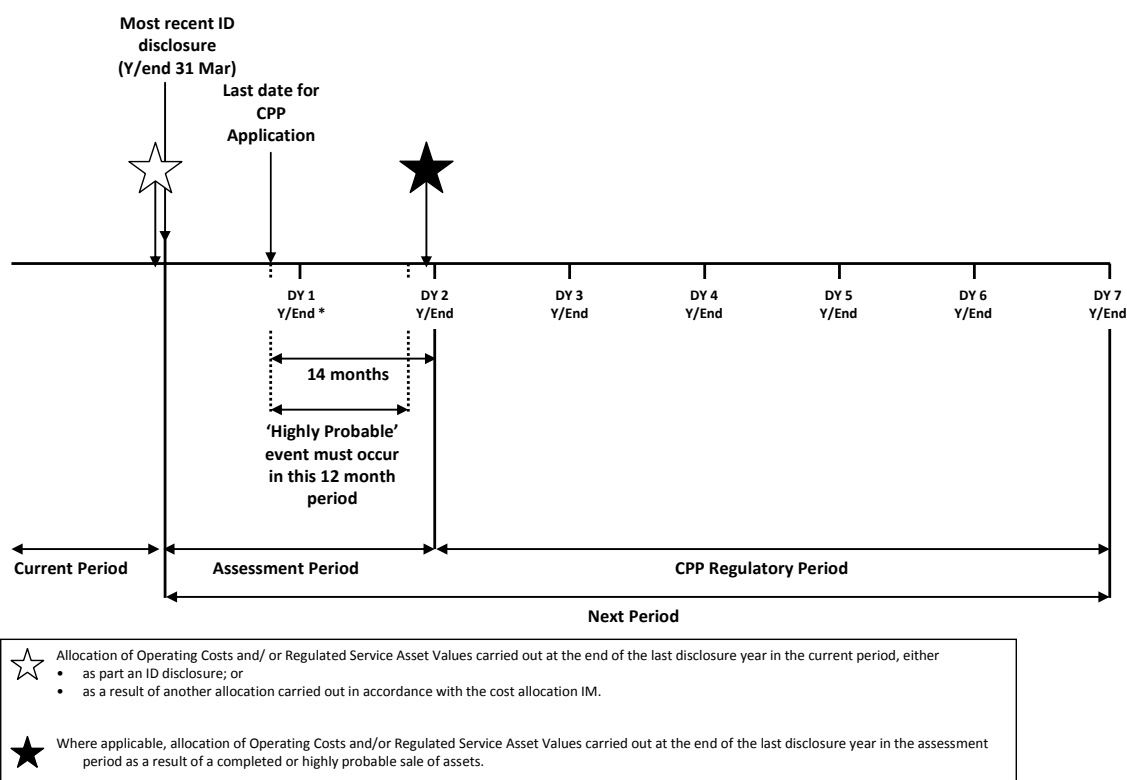
⁵³⁷ Commerce Commission, *2010-2015 Electricity distribution Default Price Quality Path Refinements Discussion and Draft Decisions Paper*, 13 August 2010.

⁵³⁸ When making CPP proposals, EDBs and GPBs must provide forecasts for all opex categories. For the purposes of ensuring that the cost allocation IM has been complied with when calculating forecasts for CPP proposals, EDBs and GPBs should read the term 'opex' interchangeably with the term 'operating costs' used elsewhere in Chapter 3 and this appendix.

- the current period, i.e. the five disclosure years prior to the day a CPP application is submitted;
- the assessment period, i.e. the period between the end of the most recent disclosure year and the anticipated commencement date of the CPP;
- the CPP regulatory period, i.e. the disclosure years in respect of which a CPP will apply; and
- the next period, i.e. the assessment period and the CPP regulatory period combined.

B8.15 Allocations of OCnDA and AVnDA must be carried out for the purposes of CPP forecasts at the end of the last disclosure year of the current period, and under circumstances discussed below may also be undertaken at the end of the last disclosure year of the assessment period. These dates are indicated in Figure B3 below with light and dark stars.

Figure B3 CPP Forecast Timelines and Operating Cost and Asset Value Allocation



Note: DY = Disclosure Year, Y/End = Year End; the illustration does not take into account catastrophic events. In the event these occur the Assessment Period may be shorter than the two Disclosure Years depicted above.

B8.16 The following provides details on how allocations must be undertaken for each of OCnDA and AVnDA at each of these dates, as well as on the triggers requiring these allocations to be made when applying the cost allocation IM for CPP applications.

B8.17 Forecasts of OCnDA allocated to the relevant regulated service in the first disclosure year of the assessment period must be consistent with an allocation of operating costs carried out in the last disclosure year of the current period. Where a disclosure has

been made in that year, a cost allocation will have been carried out for that year as part of that disclosure. If such a disclosure has not been made, the regulated supplier must carry out an allocation in accordance with the cost allocation IM.

- B8.18 RAB values must also be based on allocations made in the last disclosure year of the current period.⁵³⁹ Where an ID disclosure has been made in that year, opening RAB values in the first year of the assessment period should be equal to closing RAB values disclosed as part of that disclosure and the allocation implicit used in that disclosure should be used. Where this disclosure has not been made, another allocation needs to be carried out in accordance with the cost allocation IM in that disclosure year. In that instance, opening RAB values for the first year of the assessment period must be equal to closing RAB values calculated for the preceding year on the basis of that allocation.

Future asset disposals

- B8.19 As part of submitting a CPP application, suppliers of regulated services can take into account the sale of the assets used to supply the regulated service (which is the subject of the CPP application) as well as to supply either another regulated services, unregulated services or both.⁵⁴⁰
- B8.20 Such sales can be taken into account provided that they are completed between the beginning of the assessment period and the day on which the CPP proposal is submitted or, if not, if they are ‘highly probable’ on the day on which the CPP proposal is submitted (from hereon, these sales will be referred to in this appendix as ‘highly probable sales’).
- B8.21 If they wish to take a highly probable sale into account, the regulated supply must carry out a further allocation of:
- OCnDA in respect of the last disclosure year of the assessment period; and
 - RAB values at the end of the last disclosure year of the assessment period.

⁵³⁹ Note that ‘RAB values’ refers to all disclosure years after 2010. For 2010, the opening RAB value is equal to the initial RAB value.

⁵⁴⁰ The ability for suppliers to take into account of the effects of highly probable sales has been included as a response to submissions received from suppliers. Submitters argued that information given as part of a CPP proposal “should reflect the best information about a regulated business for the 7 year [forecast] period” (see Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 24, paragraph 78) and that this may mean that allocations previously made as part of ID disclosures may not be relevant to CPP proposals. In doing so, submitters highlighted particular scenarios where this may be the case. These included: (a) as a result of a sale of an unregulated service the regulated service could not be expected to bear that proportion of common costs (see Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers - Common Cost Allocation*, 9 August 2010, p. 24, paragraph 78); and (b) that “the driver for a CPP is likely to be some form of step change, in investment, for example” (see PricewaterhouseCoopers made on behalf of 20 Electricity Distribution Services, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 14, paragraph 39). Submitters were also unclear on the meaning of references in, paragraph 3.3.64 of the Draft Reasons Paper (Commerce Commission, *Input Methodologies (Electricity Distribution Services) Draft Reasons Paper*, 18 June 2010, p. 79, paragraph 3.3.64) to the Commission’s ability to make adjustments to disclosures made by suppliers. In response to these concerns, the Commission confirms that adjustments to cost allocation cost allocation outcomes will not be made for the purposes of setting DPPs and CPPs.

- B8.22 The Commission's criteria for 'highly probable' are based on those set out in NZ IFRS 5 for determining whether the sale of non-current assets is highly probable.⁵⁴¹ As part of the criteria set out in NZ IFRS 5, asset sales must be expected to be completed within one year of the date assets are classified as being held for sale. This is also the appropriate period in the present context, and commences from the date the CPP application is made.
- B8.23 The Commission intends that no changes in the supplier's ability to bear shared costs associated with other regulated or unregulated services during the period of the CPP forecast should affect the allocation of operating cost or the calculation of RAB values during that period apart from those which occur as a result of highly probable sales.
- B8.24 This means that where a sale is not a highly probable sale, forecasts of OCnDA for all subsequent years of the next period should be consistent with cost allocations carried out in respect of the last disclosure year in the current period:
- regulated suppliers should not reapply and of the cost allocation approaches at any time during the next period and operating costs should be projected forward based only on forecast changes in the costs associated with supplying the regulated service which is the subject of the CPP application; and
 - calculations of RAB values for each disclosure year of the next period should not be determined by carrying out any further asset allocations at any time during the next period.
- B8.25 Where such a sale is a highly probable sale:
- forecasts of OCnDA must be consistent with cost allocations carried out in respect of the last disclosure year in the assessment period; and
 - calculations of total RAB values for each disclosure year of the CPP regulatory period should not be determined by carrying out any further asset allocations.
- B8.26 When making CPP applications, the following constraints apply to forecast values of commissioned assets:⁵⁴²
- forecasts need to be based only on forecast changes in the EDB's business of supplying the regulated service to which the CPP application applies; and
 - the forecast value of any asset commissioned in the next period may not exceed the value of that asset that would be allocated to regulated services in aggregate using ACAM.

⁵⁴¹ Institute of Chartered Accountants of New Zealand, *Non-current Assets Held for Sale and Discontinued Operations (NZ IFRS 5)*, 2006.

⁵⁴² For the purposes of clarity, 'commissioned assets' with relation to CPP applications means those assets first employed by an EDB or GPB to provide the regulated service to which that application relates in any disclosure year during the next period.

Possible information requirements

B8.27 The following types of information may have to be publicly disclosed on operating cost and asset value allocations undertaken by EDBs and GPBs as part of CPP applications:

- where a disclosure under an ID Determination has not been made in the last year of the current period, information on cost allocations made pursuant to the cost allocation IM equivalent to that which is likely to be required once new information disclosure regulations come into force;
- similar information on allocations of OCnDA and AVnDA carried out at the end of the assessment period as a result of a highly probable sale;
- further information for each cost and asset allocator used on the split of cost allocator metrics and the dollar value allocations of OCnDA and AVnDA split by the different types of regulated services, and between the regulated service to which the CPP application relates, other regulated services and between regulated and unregulated services (in aggregate);
- information supporting arm's-length deductions relating to asset values to which assets deductions relate to as well as the amount of each deduction made to regulated service asset values for each asset;
- information supporting arm's-length deductions relating to operating costs to which operating cost deductions relate to as well as the amount of each deduction made for each operating cost; and
- any directors' certifications made in relation to the application of the OVABAA.

B8.28 As part of its verification process,⁵⁴³ the pre-submission verifier of the regulated supplier's CPP proposal must verify that the cost allocation IM has been applied correctly.⁵⁴⁴

⁵⁴³ For further details on the verification process refer to Chapter 9.

⁵⁴⁴ ENA submitted that independent verifiers should be required "simply to confirm or otherwise that the allocation of OCnDA and AVnDA have been made consistent with the cost allocation methodology set out in the proposal." (See Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 79-80, paragraph 320). The verifier is required to provide an opinion as to whether opex forecasts are consistent with allocations carried out at the end of the last disclosure year of the current period, and where there is a highly probable sale, at the end of the last disclosure year of the assessment period in accordance with the cost allocation IM. The verifier is also required to provide an opinion as to whether forecast asset values have been based only on forecast changes in the EDB's business of supplying electricity distribution services (see Commerce Commission, Commerce Act (*Electricity Distribution Services Input Methodologies*) Determination, December 2010, Schedule G, Clause G4).

APPENDIX C: COST ALLOCATION - MATERIALITY SCREENING TEST THRESHOLD ASSUMPTIONS

C1.1 Appendix B3 sets out details of the proposed materiality screening tests. The thresholds are as follows:

- an operating cost materiality screening test threshold of 15% of total operating costs; and
- an asset value materiality screening test threshold of 10% of aggregated unallocated closing RAB value.

C1.2 As discussed in Appendix B3, the thresholds reflect the changes in the allocation values that would be required to generate a 1-2% change in regulated revenues. Since the data quality of EDBs is superior to GPBs, and this information was readily available, the calculations only use EDB information. It is assumed that the results also apply to both EDBs and GPBs.⁵⁴⁵

C1.3 The following sets out the calculations and assumptions for deriving the materiality screening test thresholds used for the operating cost and regulated service asset value materiality tests:

- total unregulated service revenue for EDBs is assumed to comprise on average 33% of total regulated revenues. This implies that if a cost (or asset) allocation is carried out using revenue as the sole proxy cost allocator, it will result in the following allocations;
 - 67% of OCnDA (or AVnDA) are allocated to regulated services; and
 - 33% of OCnDA (or AVnDA) are allocated to unregulated services.
- given the assumed allocation of 33% to the unregulated services, a change in the allocation of OCnDA (or AVnDA) to unregulated services would only result in a 1% change in total revenues if OCnDA (or AVnDA) comprise at least 3% total regulated revenues;
- the disclosure information reveals the following;
 - 30% of the average EDB's total regulated revenue relates to the recovery of operating costs;
 - 60% of the average EDB's total regulated revenue relates to the recovery of the return on and of capital; and
 - 10% of the average EDB's total regulated revenue relates to taxation.⁵⁴⁶
- based on the above the share of revenue relating to operating cost and regulated service asset values can be calculated, namely that;

⁵⁴⁵ This figure is based the Commission's calculations on information on unregulated revenue taken from 2009 EDB Information Disclosures and Annual Reports.

⁵⁴⁶ Source: 2009 EDB Information Disclosures.

- 3% of total regulated revenue is equivalent to around 10% (i.e. 3% out of 30%) of total operating costs; and
- 3% share of revenue is equivalent to around 5% (i.e. 3% out of 60%) of the aggregated unallocated closing RAB value.

C1.4 Based on the above, the Commission has set the following thresholds:

- an operating cost screening materiality threshold of 15% of total operating costs. This corresponds to a 1.5% change in total regulated revenue; and
- an asset value materiality screening threshold of 10% the aggregated unallocated closing RAB value. This corresponds to a 2.0% change in total regulated revenue.

C1.5 As discussed in Appendix B3, the Commission has also analysed how the revenue materiality screening test threshold is likely to interact with other materiality screening test thresholds. As a result, the Commission has set the revenue materiality screening test threshold at 20% in order to ensure consistency with the 1-2% movement in regulated revenue as the materiality standard.

C1.6 The analysis underlying this is included in the Table C1 below. This table illustrates the relationship between the materiality tests and the minimum materiality threshold. It sets out the estimated effect of applying different levels of revenue materiality thresholds.

Table C1 Analysis of Effective Regulated Service Price Changes Resulting from Allocation of Costs

Company Name	A	B	A - B	(A - B) / B	Unregulated Services Description	Caught by Revenue Materiality Test Threshold					Effective Price Change		Regulated Revenue Market Share	Shared*** Costs/Total Costs	Shared*** Asset Values/RAB
	2009* Total Revenue (\$000)	2009** Regulated Revenue (\$000)	2009 Unregulated Revenue (\$000)	Unregulated Revenue/Regulated Revenue		5%	10%	15%	20%	33%	Operating Costs	Asset Values			
NorthPower	189,621	49,621	140,000	282%	Contracting	✓	✓	✓	✓	✓	12.7%	16.9%	1.9%	<5%	<5%
Electra	63,400	21,694	41,706	192%	Contracting, financial services, metering	✓	✓	✓	✓	✓	8.7%	11.5%	0.8%	<5%	<5%
Eastland Network	66,567	28,016	38,551	138%	Port, property investment, generation	✓	✓	✓	✓	✓	6.2%	8.3%	1.1%		
Westpower	36,892	18,972	17,920	94%	Contracting & consulting, generation	✓	✓	✓	✓	✓	4.3%	5.7%	0.7%	5-10%	<5%
Buller	9,704	5,266	4,438	84%	Contracting	✓	✓	✓	✓	✓	3.8%	5.1%	0.2%		
ScanPower	10,708	5,827	4,881	84%	Contracting, plumbing and gas fitting, appliance retailing, metering, tree pruning, frozen storage, solar water heating installation, knitwear manufacture	✓	✓	✓	✓	✓	3.8%	5.0%	0.2%	5-10%	<5%
Top Energy	49,173	28,228	20,945	74%	Generation	✓	✓	✓	✓	✓	3.3%	4.5%	1.1%		
Electricity Invercargill	23,647	14,806	8,841	60%	N/A	✓	✓	✓	✓	✓	2.7%	3.6%	0.6%		
Mainpower	65,033	41,049	23,984	58%	Contracting	✓	✓	✓	✓	✓	2.6%	3.5%	1.6%		
Vector ****	1,174,158	749,108	425,050	57%	Metering, gas wholesale, utilities training, tree pruning, windfarms	✓	✓	✓	✓	✓	2.6%	3.4%	29.1%		
The Lines Co	37,540	25,066	12,474	50%	Generation, contracting, transformer oil cleaning	✓	✓	✓	✓	✓	2.2%	3.0%	1.0%		
Counties Power	41,911	29,741	12,170	41%	Auto repairs, construction	✓	✓	✓	✓	✓	1.8%	2.5%	1.2%	10-20%	<5%
Marlborough Lines	48,355	34,692	13,663	39%	Contracting, dividends from Otagonet JV and Nelson Electricity	✓	✓	✓	✓	✓	1.8%	2.4%	1.3%		
The Power Company Ltd	57,546	45,845	11,701	26%	Insulation, heating, assessments, retrofits	✓	✓	✓	✓	✓	1.1%	1.5%	1.8%		
Orion	231,611	191,048	40,563	21%	Contracting	✓	✓	✓	✓	✓	1.0%	1.3%	7.4%		
Electricity Ashburton	34,212	28,339	5,873	21%	Construction, contracting	✓	✓	✓	✓	✓	0.9%	1.2%	1.1%	<5%	<5%
Unison	106,967	96,180	10,787	11%	Contracting, fibre	✓	✓	✓	✓	✓	0.5%	0.7%	3.7%	19%	4%
Network Waitaki	14,635	13,402	1,233	9%	Contracting, metering	✓	✓	✓	✓	✓	0.4%	0.6%	0.5%	<5%	<5%
Alpine Energy	38,460	35,707	2,753	8%	Contracting, metering	✓	✓	✓	✓	✓	0.3%	0.5%	1.4%	10-20%	<5%
PowerCo ****	371,019	347,539	23,480	7%	Gas wholesale, metering	✓	✓	✓	✓	✓	0.3%	0.4%	13.5%	1-2%	<3%
Transpower	693,706	655,620	38,086	6%	EMS, risk reinsurance, d-cypha Trade	✓	✓	✓	✓	✓	0.3%	0.3%	25.5%		
Horizon Energy	30,348	28,740	1,608	6%	Contracting	✓	✓	✓	✓	✓	0.3%	0.3%	1.1%		
Nelson Elec	9,046	8,999	47	1%	N/A	✓	✓	✓	✓	✓	0.0%	0.0%	0.3%		
GasNet ****	5,152	5,152	0	0%	N/A	✓	✓	✓	✓	✓	N/A	N/A	N/A		
Network Tasman Trust	36,755	36,755	0	0%	Fibre/telecoms, property	✓	✓	✓	✓	✓	N/A	N/A	1.4%	<5%	<5-10%
Centralines Ltd	8,433	8,433	0	0%	N/A	✓	✓	✓	✓	✓	N/A	N/A	0.3%		
OtagoNet Joint Venture	26,931	26,931	0	0%	N/A	✓	✓	✓	✓	✓	N/A	N/A	1.0%		

Note: * Information obtained from 2009 annual report; ** Information obtained from the 2009 Electricity Information Disclosure; and 2009 Gas Transmission Accounts and 2009 Gas Distribution Accounts disclosed pursuant to the Gas (Information Disclosure Regulations 1997; *** Percentage obtained from post-workshop submissions; **** Gas metering revenue treated differently across gas pipeline businesses.

APPENDIX D: WORKED EXAMPLE OF THE COMPONENTS OF THE COST ALLOCATION INPUT METHODOLOGY

D1 Introduction

Purpose of worked example

D1.1 This appendix provides a worked example that illustrates the practical application of the cost allocation IM and the process for selecting the appropriate cost allocation approach.

Cost allocation problem and context

D1.2 A hypothetical EDB, 'EDB Ltd', provides electricity distribution and gas distribution services, both of which are regulated under Part 4 of the Act. It also provides two unregulated services, Service A and Service B. EDB Ltd is therefore required to apply the cost allocation IM and produce information disclosure reports for the current regulatory year.

D1.3 The IM requires that any operating costs and regulated service asset values that are directly attributable to electricity distribution services supplied by the EDB must be allocated to those electricity distribution services. It also provides that any OCnDA and AVnDA must be allocated to electricity distribution services and other regulated services using either:

- accounting-based allocation approach (ABAA);
- avoidable cost allocation methodology (ACAM); or
- optional variation to the accounting-based allocation approach (OVABAA).

D1.4 In order to determine whether the EDB is able to apply ACAM to operating costs and regulated service asset values, it must apply materiality screening tests. If the thresholds in these tests are reached or exceeded an EDB should apply the ABAA. The EDB also has the option of applying the OVABAA if it considers that any unregulated services will be unduly deterred. Irrespective of the outcomes of materiality screening tests or OVABAA, the EDB may always elect to apply the ABAA.

D1.5 The remainder of this appendix sets out EDB Ltd's application of the cost allocation process using illustrative data on operating costs and regulated service asset values.

D1.6 EDB Ltd's cost accounting system does not yet fully conform to the ABAA. However, it is relatively straightforward to identify those operating costs and regulated service asset values which are directly attributable and those which are not directly attributable.

D1.7 EDB Ltd calculates that it has incurred \$7m worth of OCnDA and \$17.5m of AVnDA throughout the current regulatory year.

D2 Materiality Screening Tests

D2.1 The first step in the cost allocation process is for EDB Ltd to allocate OCDA and AVDA to the services to which they are directly attributable.

D2.2 Next, EDB Ltd has to determine which allocation approach to use to allocate OCnDA and AVnDA. It therefore needs to compile the information to undertake the mandated materiality screening tests.⁵⁴⁷

D2.3 Application of the revenue materiality screening test requires information on total unregulated revenues and total regulated revenues. The Commission defines total regulated revenue as that received from the provision of electricity distribution services and any other services regulated under Part 4. For EDB Ltd the regulated revenues are therefore the sum of revenues from its electricity distribution and gas distribution services.

D2.4 The test involves an assessment of whether total unregulated revenue is at least 20% of total regulated revenue. Calculations show that with unregulated revenues of \$8m (\$5m+\$3m), and regulated revenues of \$29m (\$20m+\$9m), EDB Ltd's unregulated revenues reach or exceed the 20% threshold ($\$8m/\$29m=28\%$).

D2.5 EDB Ltd therefore proceeds to assess the materiality of its OCnDA and AVnDA.

D2.6 Application of the operating cost materiality screening test requires information on total OCnDA and on total operating costs⁵⁴⁸ as well as on any operating costs EDB Ltd elects to recover through arm's-length transactions.

D2.7 The test involves an assessment of whether OCnDA, less any deductions of operating costs recovered through arm's-length transactions, are at least 15% of operating costs. EDB Ltd has not entered into any arm's-length transactions and therefore does not make any arm's-length deductions. Calculations show that with OCnDA of \$7m, and operating costs of \$22m (\$10m Electricity OCDA +\$5m Gas Distribution OCDA +\$7m OCnDA), EDB Ltd's OCnDA exceed the 15% threshold ($\$7m/\$22m=32\%$).

D2.8 The asset value materiality screening test requires information on AVnDA,⁵⁴⁹ aggregated unallocated closing RAB value for all types of regulated services and on any regulated service asset values relating to assets for which EDB Ltd elects to make arm's-length deductions.

⁵⁴⁷ As stated above, materiality threshold testing is optional and a regulated supplier may always elect to apply the ABAA.

⁵⁴⁸ Operating cost means expenditure incurred by the EDB in the supply of any type of regulated service and excludes: a cost that is treated as the cost of an asset by GAAP; amounts that are depreciation, tax, subvention payments, revaluations or an interest expense, in accordance with their meanings under GAAP; and pass-through costs or recoverable costs.

⁵⁴⁹ Regulated service asset values means, in respect of an asset used in the supply of any type of regulated service, unallocated closing RAB value determined in accordance with the IM Determination applicable to that type of regulated service.

- D2.9 The test involves an assessment of whether AVnDA, less any voluntary deductions in respect of assets for which capital costs have been recovered through arm's-length transactions, are at least 10% of total aggregated RAB. EDB Ltd has not entered into any arm's-length transactions and therefore does not elect to make any arm's-length deductions. Calculations show that with AVnDA of \$17.5m, and aggregated unallocated closing RAB of \$97.5m (\$60m Electricity regulated service AVDA +\$20m Gas Distribution regulated service AVDA +\$17.5m AVnDA), EDB Ltd's regulated service AVnDA exceed the 10% threshold ($\$17.5m/\$97.5m=18\%$).
- D2.10 As a result of undertaking these tests, the ABAA should be applied for both operating costs and regulated service asset values. However, on the basis that some investments might be unduly deterred, the EDB may elect to undertake an OVABAA. The application of this is set out in the next section.

D3 Application of Optional Variation to the Accounting-based Allocation Approach

- D3.1 EDB Ltd carries out an allocation of OCnDA and AVnDA using cost allocators based on causal factors. The outcome of this allocation is shown in Table D1 below. However, EDB Ltd expects that its investment in unregulated Service B might be unduly deterred as a result of these allocations. It therefore considers that it might not be appropriate for it to base information disclosures on the allocation of costs it achieved using this allocation approach and that it may be more appropriate for it to apply the OVABAA.
- D3.2 The EDB therefore undertakes an assessment of the viability of unregulated Service B based on allocations made to it using the ABAA. EDB Ltd makes this assessment using EBITDA as a measure of profitability and ROI as a measure of return on capital.⁵⁵⁰ As shown in bold in Table D1 below, unregulated Service B has an EBITDA of \$100k and an ROI of 1%.

⁵⁵⁰ This measure of economic performance is purely chosen for illustrative purposes. In practice, the Commission considers that EDBs may also consider a wider range of economic evidence when determining whether individual unregulated services have been unduly deterred.

Table D1 Outcomes of the ABAA (\$000)

	Regulated Services		Unregulated Services		Consolidated
	Electricity	Gas Distribution	Service A	Service B	Total
Revenue	20,000	9,000	5,000	3,000	37,000
OCDA	10,000	5,000	3,000	2,000	20,000
OCnDA using ABAA	2,900	2,000	1,200	900	7,000
EBITDA	7,100	2,000	800	100	10,000
AVDA	60,000	20,000	8,000	7,500	95,500
AVnDA using ABAA	10,000	4,000	1,000	2,500	17,500
Total RAB	70,000	24,000	9,000	10,000	113,000
ROI	10%	8%	9%	1%	9%

Note: OCDA means operating costs-directly-attributable; OCnDA means operating costs-not-directly-attributable; EBITDA means earnings before interest, tax, depreciation and amortisation; AVDA means regulated service asset values directly attributable; AVnDA means regulated service asset values not directly attributable; ROI means return on investment.

- D3.3 EDB Ltd's view is that for this reason use of this allocation approach would result in Service B being unduly deterred (i.e. Service B will be discontinued or not provided solely as the result of the allocation of OCnDA or AVnDA it is required to bear). It therefore refers to the Commission's rules on the OVABAA.
- D3.4 The OVABAA allows EDB Ltd to reduce each or both of operating costs and regulated service asset values allocated to Service B up to the point where its investment in this service is no longer unduly deterred. In doing so, EDB Ltd can reduce costs allocated to Service B only, asset values allocated to Service B only, or any combination of the two. However, aggregated reductions in allocation of costs and assets to Service B should only be made to the extent necessary for the service to become viable. As a minimum, after reallocations made as part of the OVABAA, Service B must bear at least all CDA applicable to that service and all those costs that would be allocated to it if ACAM were applied
- D3.5 Following the reduction of OCnDA and AVnDA allocated to Service B, these amounts must be reallocated across the remaining regulated and unregulated services using the same set of cost allocators as used in the original allocation. In practice, this needs to be undertaken by grossing up the cost allocators or asset allocator metrics (which can be reduced, in practice, to proportions of costs to be allocated to each service) to reflect the cost no longer borne by Service B.
- D3.6 Using data from the economic assessments it made above, (which in this case are, for simplicity, limited to the considerations of EBITDA and ROI), the EDB considers that Service B can only bear \$405k of OCnDA and \$1,125k of AVnDA i.e. it elects to make a proportionally equal reduction in each of OCnDA and AVnDA of 55% (\$495k/\$900k and \$1,375k/\$2,500k). The OVABAA therefore results in a reduction of OCnDA allocated to Service B of \$495k and a reduction of AVnDA allocated to Service B of \$1,375k. These figures are shown in Table D2. The OCnDA and AVnDA, less the reduced amount now allocated to Service B under the OVABAA, are now re-allocated across electricity distribution services, gas distribution services

and all remaining unregulated services (i.e. Service A). This is done by grossing up allocation percentages based on the same set of cost allocators as used in the first allocation carried out. The resulting re-allocations are set out in Table D2.

Table D2 Net Changes from the ABAA to the OVABAA (\$000)

	Regulated Services		Unregulated Services		Consolidated
	Electricity	Gas Distribution	Service A	Service B	Total
OCnDA using ABAA	2,900	2,000	1,200	900	7,000
OCnDA using OVABAA	3,136	2,162	1,297	405	7,000
Net change	236	162	97	(495)	-
AVnDA using ABAA	10,000	4,000	1,000	2,500	17,500
AVnDA using OVABAA	10,916	4,367	1,092	1,125	17,500
Net change	916	367	92	(1,375)	-

D3.7 If EDB Ltd considered that further unregulated services might be unduly deterred, it would repeat the process described in paragraphs D3.3 to D3.6 until a cost allocation outcome is reached where the EDB considers that the investment is viable. For the purposes of this worked example it is assumed that this outcome is reached after the first re-allocation.

D3.8 The cost allocation and the desired EBITDA and ROI achieved using the OVABAA are set out in Table D3 below. Following the completion of this process EDB Ltd provides a directors' certification to the Commission to support this allocation.

Table D3 Outcomes of the OVABAA (\$000)

	Regulated Services		Unregulated Services		Consolidated
	Electricity	Gas Distribution	Service A	Service B	Total
Revenue	20,000	9,000	5,000	3,000	37,000
OCDA	10,000	5,000	3,000	2,000	20,000
OCnDA using OVABAA	3,136	2,162	1,297	405	7,000
EBITDA	6,864	1,838	703	595	10,000
AVDA	60,000	20,000	8,000	7,500	95,500
AVnDA using OVABAA	10,916	4,367	1,092	1,125	17,500
Total RAB	70,916	24,367	9,092	8,625	113,000
ROI	10%	8%	8%	7%	9%

D4 Information Disclosure

- D4.1 Table D4 and Table D5 provide illustrations of the information that the Commission may require EDB Ltd to disclose as part of ID on operating cost allocations made for this period. Similar information on regulated service asset value allocations would also need to be provided but for illustrative purposes only tables for operating cost allocations have been included.
- D4.2 To complete Table D4, EDB Ltd would provide details of OCDA and OCnDA in each operating cost category, allocated to each of type of regulated service and unregulated services (in aggregate).

Table D4 Public Report on Operating Cost Allocations (\$000)

Operating Cost Category	Operating Cost Allocator	Regulated Services		Unregulated Services	Consolidated	OVABAA Allocation Increase
		Electricity	Gas Distribution	Service A & B	Total	
Cost Category 1	OCDA	2,500	1,250	1,250	5,000	35.4
	OCnDA	470	324	255	1,050	
	Total	2,970	1,574	1,505	6,050	
Cost Category 2	OCDA	3,000	1,500	1,500	6,000	59.0
	OCnDA	784	541	426	1,750	
	Total	3,784	2,041	1,926	7,750	
Cost Category 3	OCDA	1,500	750	750	3,000	47.2
	OCnDA	627	432	340	1,400	
	Total	2,127	1,182	1,090	4,400	
Cost Category 4	OCDA	1,000	500	500	2,000	47.2
	OCnDA	627	432	340	1,400	
	Total	1,627	932	840	3,400	
Cost Category 5	OCDA	2,000	1,000	1,000	4,000	47.2
	OCnDA	627	432	340	1,400	
	Total	2,627	1,432	1,340	5,400	
Total	OCDA	10,000	5,000	5,000	20,000	236
	OCnDA	3,136	2,162	1,702	7,000	
	Total	13,136	7,162	6,702	27,000	
	Operating Costs					

D4.3 In order to complete Table D5, EDB Ltd would provide a description of all cost allocators used, along with the rationale for using these allocators and a list of all operating costs which have been allocated using them. EDB Ltd would also provide details of whether each cost allocator used is based on a causal relationship or is a proxy allocator.

Table D5 Public report on operating cost allocations

Operating Cost Category	Cost Allocator	Allocator Type	Allocation Methodology Type	Selection Rationale	Line Items
Cost Category 1	Allocator 1	Causal	OVABAA	[Explanation]	[Line items]
	Allocator 2	Proxy	OVABAA	[Explanation]	[Line items]

Note: A description of all cost allocators used is to be provided for each cost category. A list of operating costs included in allocations using each allocator is also to be provided in the final column.

D5 Monitoring Information Requirements

D5.1 Table D6 illustrates the additional information that will probably be required by the Commission for the purposes of monitoring EDB Ltd's compliance with the cost allocation IM. For this worked example, the information requirements for operating costs are illustrated in the table below for a single operating cost category and would also be required for regulated service asset values. In practice, tables would be completed for all operating cost categories. The exact requirements are likely to be specified in spreadsheet templates provided by Commission for suppliers to populate.

Table D6 Non-public Report on Operating Cost Allocations (\$000)

Cost Allocator	Allocator Type	Allocator Metrics or Proportion Allocated			Value Allocated			OVABAA Allocation Increase	Line Items
		Electricity	Gas Distribution	Unregulated Services	Electricity	Gas Distribution	Unregulated Services		
Cost Category 1: OCDA									
	Directly Attributable	N/A	N/A	N/A	2,500	1,250	1,250		[Line items]
Cost Category 2: OCnDA									
Allocator 1	Causal	17,640	9,729	6,383	118	65	65	6.4	[Line items]
Allocator 2	Proxy	5,292	3,892	3,191	353	259	213	29.0	[Line items]
Total OCnDA					470	324	255	35.4	

APPENDIX E: COMPONENTS AND APPLICATION OF THE IM FOR THE VALUATION OF ASSETS

E1 Introduction

E1.1 This Appendix discusses and expands on the detailed components of the IM for the valuation of assets for EDBs and GPBs and includes discussion of the following:

- a. adjustments to establish initial RAB values;
- b. intangible assets;
 - i. goodwill;
 - ii. working capital;
 - iii. finance leases;
- c. additions and disposals;
- d. works under construction;
- e. easements;
- f. capital contributions and vested assets;
- g. sale and purchase of assets;
- h. lost and found assets;
- i. depreciation;
- j. stranded assets;
- k. the consumer price index (CPI); and
- l. application of the IM for the valuation of assets to information disclosure and default/customised price-quality regulation.

E2 Adjustments to Establish Initial RAB Values

E2.1 Chapter 4 of this Paper discusses how regulated suppliers must establish their initial RAB values under Part 4. This section expands on that discussion, in particular in relation to adjustments regulated suppliers are permitted to make to their existing regulatory valuations.

E2.2 The IM Determinations require EDBs and GPBs to establish their initial RAB values from existing regulatory valuations, namely:

-
- a. the regulatory asset values disclosed in 2009 in accordance with applicable information disclosure requirements;⁵⁵¹ or
 - b. in the case of assets that are subject to the Gas Authorisation, the RAB values determined under the Gas Authorisation as at 30 June 2005, updated to the financial year ending in 2009 for capital expenditure, depreciation and CPI-indexation.
- E2.3 Submitters have proposed a number of adjustments to existing valuations to address what they describe as ‘deficiencies’ in disclosed regulatory values. Chapter 4 and Appendix F discuss the Commission’s consideration of these submissions (see paragraphs 4.3.37 - 4.3.46 and Section F5).
- E2.4 The IM Determinations permit EDBs and GPBs to adjust their initial RAB values to:
- a. correct for known errors in asset registers, with respect to the application valuation approaches under existing information disclosure requirements (with the exception of assets covered by the Gas Authorisation);
 - b. make adjustments to ensure that assets included in the initial RAB values align with the definitions of electricity lines services and gas pipeline services provided for in sections 54C and 55A of the Commerce Act;
 - c. in the case of EDBs:
 - i. adjust the application of multipliers in their 2004 ODV valuations where better information has become available since 2004 (including revised ranges and application for some multipliers);
 - ii. reapply the optimisation and economic value tests set out in the 2004 ODV Handbook, with respect to assets where an optimisation or economic value adjustment in 2004 led to either a full or partial write-down;
 - iii. ensure finance during construction (FDC) costs are accounted for in establishing the initial RAB value of assets; and
 - d. in the case of Vector’s NGC Distribution and NGC Transmission assets, adjust the value to provide for CPI-indexation from the first day of the disclosure year 2006.
- E2.5 The IM Determination does not permit regulated suppliers to go further, and make adjustments that would amount to changes to the ODV approach.
- E2.6 An independent engineer must assess all adjustments to the initial RAB value.⁵⁵² This is to ensure the requirements of the IM Determinations and, in the case of

⁵⁵¹ With respect to assets previously owned by NGC, the regulatory asset value disclosed in 2009 may be modified to the value it would have had, had it been indexed using CPI since the first day of the disclosure year 2006. This modification must be made in a way that is consistent with the method used by the Commission in its ‘Gas Control Model’ for the purpose of the Gas Authorisation. This recognises that there might have been an expectation that, if and when the NGC assets were subject to price-quality regulation, those assets might have been indexed post-2005 consistent with the treatment of Vector (Auckland) assets under the Gas Authorisation.

⁵⁵² The definition of ‘engineer’ in the IM Determinations includes a requirement that such an individual be ‘independent’ (as defined in the IM Determination).

EDBs, the 2004 ODV Handbook, are correctly applied, and that any resulting changes to the initial RAB value are based on an objective assessment of the permitted adjustments.

- E2.7 PwC suggested an audit process for adjustments to the initial RAB value, whereby auditors would certify that the adjustments, as documented in the EDB's report, are consistent with the Determination.⁵⁵³ The Commission intends to specify audit and verification requirements for adjustments to initial RAB values at the time the initial RAB value is first disclosed. This is likely to be either in the context of information disclosure requirements, to be developed by the Commission, or as part of information requests under s 53ZD or s 98 when developing initial starting price adjustments for DPPs.
- E2.8 As Chapter 4 explains (see paragraph 4.3.45), the Commission considers certainty for both suppliers and consumers will be enhanced going forward by 'locking in' the initial RAB value at the time it is established. Regulated suppliers will not be permitted to revisit aspects of the initial RAB value, such as asset register corrections, at a future date.
- E2.9 The following sections discuss permitted adjustments separately for EDBs and GPBs.

Adjustments for EDBs

- E2.10 This section discusses the merits of the following types of adjustments to EDBs' disclosed 2009 asset values, in light of submissions received during the consultation process and the prior treatment of ODV valuations in the electricity distribution sector:
- a. correction of errors: corrections to the incorrect application of the 2004 ODV Handbook (e.g. asset register corrections);
 - b. changes in relation to existing multipliers: changes to the application of the 2004 ODV Handbook, based on better information or techniques available since 2004 (e.g. expansion of the application of certain multipliers to additional assets and expansion to the scope of existing multipliers);
 - c. application of optimisation and economic value tests: changes to the application of the 2004 ODV Handbook, based on 2009 circumstances differing from those in 2004 (e.g. re-optimisation or a new economic value test);
 - d. changes to the ODV approach, such as
 - i. changes based on assuming the only appropriate valuation would be a new current ODV valuation (e.g. up-to-date MEAs valued at current

⁵⁵³ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: PricewaterhouseCoopers, IDV Corrections Report: prepared for Electricity Networks Association, 20 August 2010*, p. 19.

- replacement costs, or new costs arising since 2004 that were not faced by the EDB at that time);⁵⁵⁴
- ii. changes to the principles/assumptions underlying the ODV approach (i.e. use of a piecemeal/incremental construction assumption rather than a significant scale of construction assumption); and
- e. adjustments that could be made to the RAB value outside the application of the ODV approach (e.g. inclusions and exclusions to ensure the initial RAB value includes (only) assets used to provide electricity line services, as defined by s 54C).

Correction of errors

Approach

E2.11 EDBs can adjust disclosed 2009 values to correct for known errors that existed in the asset register as at 31 March 2009. This includes the following types of corrections:

- a. assets omitted or included in error;
- b. assets included but allocated to the incorrect asset category;
- c. assets included with incorrect ages; and
- d. assets where estimates were made about quantity, age, category or location of the asset which are now known to be incorrect.

E2.12 Where EDBs choose to apply this adjustment, they must do so at the time the initial RAB value is established. Asset inclusions and value corrections are achieved by taking the value that would have applied under the Electricity Information Disclosure Requirements 2004 had the asset been correctly recorded, and rolling that value forward to 31 March 2009 taking account of depreciation and CPI indexation.

Reasons

E2.13 The Commission considers that correcting for known errors in asset registers reinforces the credibility of the existing regulatory valuations under Part 4, and might assist with the practical requirements of rolling forward the value in the regulatory accounts of EDBs, such as depreciation and disposal calculations.

E2.14 A number of submitters supported permitting asset register corrections.⁵⁵⁵ PwC on behalf of ENA noted that EDBs should be permitted to correct for all known errors

⁵⁵⁴ This category of adjustments is associated with the Wilson Cook submission Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: Wilson, Cook and Co Limited, Commerce Commission and Regulatory Asset Bases for Electricity Distribution and Gas Pipeline (Distribution) Businesses: a expert statement for Powerco Limited*, 20 August 2010. Wilson Cook sets out 19 different types of deficiencies claimed to be associated with the 2004 ODVs that, in Wilson Cook's opinion, could only be resolved by a new ODV revaluation at the commencement of the Part 4 regime, based on a new ODV Handbook. These deficiencies appear to be based on a counterfactual which assumes a new 2009 ODV revaluation, based on an up-to-date Handbook (in terms of both methodology and costs), is the only suitable valuation option. This counterfactual is clearly different from one based on a reasonable application of the approach set out in the 2004 ODV Handbook using information available at the time (or that subsequently came to light about that time period).

⁵⁵⁵ Electricity Networks Association *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, p. 26, paragraph 120; Electricity Networks Association *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and*

and that corrections should not be limited to omissions or errors found during valuation or disclosure audits.⁵⁵⁶ The Commission agrees with PwC on this point; the IM Determination provides that EDBs may correct for any errors of the types described in paragraph E2.11 above, where the errors relate to 2009 disclosed assets.

- E2.15 PwC on behalf of ENA submitted that error adjustments should also be allowed in the roll forward.⁵⁵⁷ The proposed adjustments to EDBs' 2009 disclosed values give EDBs a comprehensive opportunity to correct for errors in initial RAB values. Allowing EDBs, as part of the roll forward, to make further adjustments for errors that existed in the 2009 disclosed values, would amount to revisions to the initial RAB value after it has been established. This would reduce certainty for both suppliers and consumers under the Part 4 regime. The Commission therefore considers that future corrections should be limited to corrections for found assets commissioned after the 2009 disclosure year, and lost assets added to the RAB value after that year.
- E2.16 Where corrections are made to asset registers up until 2009 for the purposes of the Electricity Information Disclosure Requirements 2004, the corrections should be in line with the valuation rules and methodology that applied under those requirements. Accordingly, asset inclusions and value corrections are to be implemented by taking the value that would have applied under the Electricity Information Disclosure Requirements 2004 had the asset been correctly recorded, and rolling that value forward to 31 March 2009 taking account of depreciation and CPI indexation.

Changes in relation to existing multipliers

Approach

- E2.17 The IM Determination permits EDBs to adjust the application of multipliers in the 2004 ODV Handbook in their 2004 valuations where better information has become available since 2004 on the appropriate application of those multipliers. Further, EDBs may adjust the application of multipliers in their 2004 valuations in line with the revised ranges and application below:
- a. rugged terrain multiplier: 1.2 to 1.8 times, which may also be applied to non-standard designs of overhead line networks that accommodate difficult physical or climatic conditions involving swampy ground, high winds or snow;
 - b. business district multiplier: 1.15 to 2.5 times; and
 - c. rocky ground multiplier 1.0 to 2.0 times, which may also be applied to cables laid in loose rock or sand.

Draft Reasons Papers, Attachment: PricewaterhouseCoopers, IDV Corrections Report: prepared for Electricity Networks Association, 20 August 2010, p. 6.

⁵⁵⁶ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: PricewaterhouseCoopers, IDV Corrections Report: prepared for Electricity Networks Association, 20 August 2010, p. 6.*

⁵⁵⁷ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: PricewaterhouseCoopers, IDV Corrections Report: prepared for Electricity Networks Association, 20 August 2010, p. 7.*

E2.18 As noted in paragraph E2.5 above, any adjustments to the initial RAB value must be undertaken for an EDB by an independent engineer. This will also apply to judgements on what level of multiplier within the permitted range should be used. Thus the actual multipliers used should reflect an objective assessment of the particular circumstances.

Reasons

E2.19 Since 2004, techniques used to determine the application of multipliers have been further developed, and better information has become available.⁵⁵⁸ Allowing adjustments to reflect improved information and techniques, where had the information been known at the time, EDBs would reasonably have been expected to have incorporated it in 2004 valuations, is consistent with the Commission's intention of drawing a 'line in the sand' at the start of Part 4 under the issues raised in relation to replacement cost-based valuations undertaken in the past. ENA supported this reapplication of 2004 multipliers.⁵⁵⁹

E2.20 In submissions on the Draft Determination ENA, PwC on behalf of ENA, and PwC on behalf of 20 EDBs suggested changes to the ranges for a number of multipliers.⁵⁶⁰ The changes proposed in these submissions are a result of better information becoming available about the application of the multipliers in the 2004 ODV Handbook. Similarly, Mr Wilson on behalf of Powerco stated that the multipliers in the 2004 Handbook do not have sufficient ranges, and that new multipliers are needed to deal with non-standard conditions (for example swampy ground, high altitudes).⁵⁶¹ Accordingly, the Commission has amended the multiplier ranges, and the scope of application of the rugged terrain and rocky ground multipliers.⁵⁶²

E2.21 In addition to the ranges proposed by submitters, the Commission considers the low end of the rocky ground multiplier should be 1.0, to address the possibility that when applied to different types of ground (such as loose rock and sand), the multiplier required may be less than that for rock.

⁵⁵⁸ Powerco Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper, Attachment: Wilson, Cook and Co, Electricity distribution network fixed asset valuations and valuation handbook: a letter to Powerco Limited*, 15 March 2010, p. 9.

⁵⁵⁹ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, p. 26, paragraph 123.

⁵⁶⁰ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, p. 27, paragraph 127; Electricity Networks Association *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: PricewaterhouseCoopers, IDV Corrections Report: prepared for Electricity Networks Association*, 20 August 2010, p. 8 and pp. 22-23; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers* 19 August 2010, p. 14, paragraph 30.

⁵⁶¹ Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: Wilson, Cook and Co Limited, Commerce Commission and Regulatory Asset Bases for Electricity Distribution and Gas Pipeline (Distribution) Businesses*, 20 August 2010, p. 17.

⁵⁶² Wilson stated that extended CBD multiplier ranges may still be inadequate in catering for all circumstances, but was unable to provide evidence or suggest specific changes. See Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Revised Draft Determination, Attachment: Supplementary Statement of Jeffrey Webster Wilson, Commerce Commission and Regulatory Asset Bases for EDBs and GPBs*, 19 November 2010 pp. 5 and 8.

E2.22 Submitters who commented on this topic in technical consultation agreed with the Commission's revisions to the range of existing multipliers.⁵⁶³ For example Wellington Electricity stated it agreed with the wider range and scope of existing multipliers. Orion stated that the "inclusion of revised asset multipliers in the Draft Determination is a positive development".⁵⁶⁴ Application of the revised values will correct mistakes that were made in arriving at the 2004 ODV values that have only become apparent through the passing of time".⁵⁶⁵

Application of optimisation and economic value tests

Approach

E2.23 For assets where an optimisation or application of the economic value test in 2004 led to either a full or partial write-down in their values, but which were usefully employed in the supply of electricity lines services as at 31 March 2009, EDBs may reapply the optimisation and economic value tests set out in the 2004 ODV Handbook in respect of those assets in light of demand as at 2009. EDBs may reinstate the asset, or adjust its 2004 value accordingly, and roll forward the resulting 2004 values to 31 March 2009 for depreciation and CPI-indexation.

Reasons

E2.24 The Commission's intent is to allow EDBs to adjust the value of assets that were previously written down or written off under the optimisation test and economic value adjustments, and which at the end of the 2009 disclosure year remain in service. These adjustments should include those assets where the optimisation or economic value adjustment had resulted in a reduction or partial write down in value, as well as assets that were excluded or fully written down. As discussed in Chapter 4 (see paragraph 4.3.40), the Commission does not consider this adjustment is necessary in order to ensure consistency with the Part 4 Purpose. However, in the Commission's view, allowing EDBs to reapply optimisation and economic value tests to reflect current usage is also not inconsistent with the Part 4 Purpose.

E2.25 The IM Determination incorporates proposals put forward by PwC that the adjustments to the initial RAB value should encompass all optimisations and EV adjustments in the 2004 ODV valuations. This includes where the optimisations and EV adjustments resulted in a partial write-down of the asset, rather than a full write-off.⁵⁶⁶

E2.26 Some parties submitted that this adjustment would not recognise the full value of spare capacity. Powerco submitted that the value of existing spare capacity needs to be addressed explicitly when the initial RAB value is locked in.⁵⁶⁷ Mr Wilson (for Vector) submitted that optimisation should encompass longer planning periods than

⁵⁶³ See Wellington Electricity Lines Limited, *Submission on EDBs Revised Input Methodologies Draft Determination*, 12 November 2010, p. 3; Orion New Zealand Limited, *Submission on EDBs Revised Input Methodologies Draft Determination*, 11 November 2010, pp. 1-2; Powerco Limited, *Submission on EDBs and GPBs Revised Input Methodologies Draft Determination*, Attachment: *Mark Ups*, 12 November 2010, paragraph 25.

⁵⁶⁴ *ibid.*

⁵⁶⁵ *ibid.*

⁵⁶⁶ PricewaterhouseCoopers, *Submission on EDBs (Input Methodology) Draft Determination and Reasons Paper, Asset Valuation Submission made on behalf of 20 Electricity Distribution Businesses*, 19 August 2010; PwC for 20 EDBs, *Submission on EDBs Draft Determination and Reasons Paper, Asset Valuation*, pp.13-14, paragraph 29.

⁵⁶⁷ Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 20 August 2010, p.19.

those in the 2004 ODV Handbook, or should be removed completely.⁵⁶⁸ Similarly, ENA submitted that reapplication of optimisations should exclude capacity optimisations.⁵⁶⁹

- E2.27 The IM Determination allows EDBs to re-optimize those assets that were fully or partially written down as a result of optimisation in the 2004 ODV valuations, applying the 2004 Handbook but applying 2009 demand data (including load forecasts). The 2004 ODV Handbook allows ODV valuations to take account of forecast load growth for up to a ten year horizon, depending on the asset type. Thus the effect of this adjustment is to provide that where asset values were optimised down in 2004, their initial RAB value will reflect the extent to which the asset is currently used to provide electricity distribution services, including an allowance for load growth.
- E2.28 The reapplication of optimisation and the economic test is not mandatory. Thus EDBs may choose whether or not to apply this adjustment, taking account of the compliance costs of doing so. However, if an EDB chooses to reapply optimisation and economic value tests, it must do so across all assets that were fully or partially written down as a result of such tests in the 2004 valuation.

Adjustments to the RAB value outside the application of the ODV approach

Approach

- E2.29 EDBs may include in the initial RAB value the value of any load control relays owned by EDBs and used to provide electricity line services as at 31 March 2009, in order to ensure that assets used to provide electricity line services, as defined in s 54C, are included in the initial RAB. Where an EDB includes load relays in the initial RAB value, it must establish RAB values for these assets using depreciated historic cost, or, where information is not available to derive the DHC value, at book value as provided for in the EDB's audited general purpose financial statements.
- E2.30 The IM Determination requires EDBs to exclude from the initial RAB value the value of any assets not used to provide electricity line services, as defined in s 54C, as part of the rules for determining the composition of the initial RAB.

Reasons

- E2.31 All EDBs should be permitted to include in their RAB values all assets used to supply electricity lines services, as defined by s 54C. PwC, on behalf of ENA,⁵⁷⁰ proposed that the boundary between electricity line services (defined in s 54C) and other services needs to be better defined, and provided a list of asset types that were excluded from ODVs under the 2004 Handbook, but should, in its submission, be included in the RAB value under s 54C (see Table E1). PwC also submitted that adjustments to the scope of the RAB for consistency with s 54C should include both

⁵⁶⁸ Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Revised Draft Determination, Attachment: Supplementary Statement of Jeffrey Webster Wilson, Commerce Commission and Regulatory Asset Bases for EDBs and GPBs*, 19 November 2010, p. 6.

⁵⁶⁹ Electricity Networks Association, *Submission on EDBs Revised Input Methodology Draft Determination*, 12 November 2010, p. 8, paragraph 19.

⁵⁷⁰ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: PricewaterhouseCoopers, IDV Corrections Report: prepared for Electricity Networks Association*, 20 August 2010, p. 17.

inclusions and exclusions.⁵⁷¹ Assets that were excluded from 2004 ODVs consistent with the 2004 ODV Handbook should now be included.⁵⁷²

Table E1 PwC proposals for asset types that should be included in the RAB value

Proposed Treatment	Asset Type
Excluded as directly attributed to non electricity lines services	<ul style="list-style-type: none"> • Non network related stores and spares • Streetlights and poles • Streetlight control relays and circuits • Consumer-based meters (except transmission revenue meters)
Included as directly attributed to electricity lines services	<ul style="list-style-type: none"> • Load control relays • Transmission revenue meters • Office buildings required for real time operation and control of the distribution network • Computer systems used for real time network operation and control • Asset management systems, including geographic information systems, used for real time network operation and control
Shared between electricity lines services and non-electricity lines services in accordance with the cost allocation IM, where unable to be directly attributed to either electricity lines services or non-electricity lines services	<ul style="list-style-type: none"> • Office buildings, except where required for the real time operation and control of the distribution • Depots and workshops • Office furniture and equipment • Motor vehicles • Tools, plant and machinery • Non-network related land • Non-network related stores and spares • Computer systems, except computer systems that are used for real time network operation and control • Asset management systems, including geographic information systems, except where such systems are used for real time network operation and control
Excluded due to alternative provisions	<ul style="list-style-type: none"> • Works that are under construction

⁵⁷¹ PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, pp. 13-14, paragraph 29.

⁵⁷² PwC was supported on this point by Powerco, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Wilson, Cook and Co Limited, *Commerce Commission and Regulatory Asset Bases for Electricity Distribution and Gas Pipeline (Distribution) Businesses*, p. 25, paragraph 73. and Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper, Attachment: Wilson Cook & Co Ltd. Report - Commerce Commission and Regulatory Asset Bases for EDBs and GPBs*, 21 August 2010, p 24, paragraph 75.

- E2.32 The 2004 ODV Handbook set out the valuation approach to be used for ‘system fixed assets’ only. Accordingly, the 2004 ODV Handbook explicitly excluded non-system fixed assets from its scope.⁵⁷³
- E2.33 However, EDBs are required to disclose values for non-system fixed assets under the current ID Requirements.⁵⁷⁴ The IM Determination requires that the initial RAB for EDBs is composed of all assets included by each EDB in the ‘Total Regulatory Asset Base Value (Excluding FDC)’ category for the 2009 disclosure year, in the 2009 disclosure reports. That total includes both the rolled forward ODV and non-system fixed assets. Thus the 2009 disclosed values already include non-system fixed assets that were excluded from 2004 ODVs, under the 2004 ODV Handbook.
- E2.34 Under the current ID Requirements, non-system fixed assets are defined to include all fixed assets used by an EDB to provide lines business services, and which are not system fixed assets. In the Commission’s view, this means the 2009 disclosed values should capture most assets used to provide electricity line services, as defined in s 54C (including those assets listed in Table E1 as directly attributable to electricity lines services, or shared between electricity lines services and non electricity lines services). The one exception to this is load control relays, which were explicitly excluded from the ODV as a result of applying the 2004 ODV Handbook, and were not otherwise captured in disclosed values. The Commission considers where an EDB owns load control relays, it should be able to include these in the RAB value subject to the cost allocation IM, and that doing so will promote demand side management consistent with s 54Q.
- E2.35 Genesis asked the Commission to reconsider whether load control relays should be treated as part of an EDB’s regulated services, as it considers provision of them to be contestable.⁵⁷⁵ Where load control relays are owned by an electricity retailer, rather than an EDB, it is reasonable that the EDB would pay a fee for the use of these assets, which would appropriately be treated as operating expenditure under Part 4. Allowing inclusion of load control relays in the RAB value where these are owned by the EDBs, subject to the cost allocation IM, will ensure decisions on whether to own or rent these assets are not distorted.
- E2.36 Accordingly, where an EDB owns load control relays, it may include the value of these in the initial RAB value as part of the asset adjustment process for determining the initial RAB value. The initial RAB value of such assets should be their existing book value in the EDB’s audited general purpose financial statements. Utilising an existing value reduces compliance costs compared to the alternative approach of requiring an independent valuer to establish the asset’s value. As the assets involved are unlikely to be material, as a proportion of the total RAB value, the risk associated with using existing values appears to be low.

⁵⁷³ Commerce Commission, *Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Businesses*, 20 August 2004, p. 11.

⁵⁷⁴ Commerce Commission, *Electricity Distribution (Information Disclosure) Requirements 2008*, 31 October 2008, Schedule 5 and Schedule 8.

⁵⁷⁵ Genesis Energy Limited, *Submission on EDBs Revised Input Methodologies Draft Determination*, 11 November 2010, pp. 1–2.

E2.37 If the Commission provided a definition of the boundary between electricity line services, as proposed by PwC (for example with reference to specific asset types) it would run the risk of unintentionally excluding assets that legitimately should be included in the RAB value. Further, such a definition could become out-of-date as technology and business practices change. On balance, the Commission considers further prescription on this topic is not warranted.

Accounting for FDC costs in establishing the initial RAB value

Approach

E2.38 The IM Determination requires EDBs to multiply the value of system fixed assets in the initial RAB by a factor of 1.0245 to account for the costs of financing during construction. This includes system fixed assets that are included in the RAB value, or whose RAB value is modified, as a result of the initial RAB adjustment process.

Reasons

E2.39 The IM Determination requires EDBs to establish initial RAB values at a disaggregated level (i.e. for each asset in the RAB value). To achieve this, initial RAB values for EDBs are to be based on the asset values included by each EDB in the 'Total Regulatory Asset Base Value (Excluding FDC)' category for the 2009 disclosure year, from 2009 disclosure reports.⁵⁷⁶

E2.40 So that initial RAB values for EDBs are equivalent to their aggregate values under existing disclosure requirements, including an allowance for FDC, the IM Determination provides that the disclosed values for each system fixed asset in the initial RAB is multiplied by a factor of 1.0245 to account for the costs of financing during construction. The IM determination similarly requires the initial RAB value to be adjusted to account for FDC costs, where the adjustment process for setting the initial RAB results in a system fixed asset either being added to the RAB value, or having its RAB value modified.

Changes to the ODV approach

Approach

E2.41 The Determination does not permit other adjustments that would amount to changes in the 2004 ODV approach. This includes the types of adjustments described in paragraph E2.10d.

Reasons

E2.42 Changes to update MEAs and replacement costs are based on the assumption that the only appropriate valuation basis for the initial RAB value would be a new current ODV valuation. For the reasons set out in Chapter 4, the Commission does not consider that a new valuation is required by the Part 4 Purpose. Similarly, the Commission does not consider the Part 4 Purpose requires that initial RAB values for existing assets reflect current replacement costs (see paragraphs 4.3.47 - 4.3.63 for a fuller discussion).

E2.43 Submitters have not provided any evidence that changes of this nature are required to ensure that they earn at least a normal return on the value of their past

⁵⁷⁶ Under existing ID Requirements for EDBs, an allowance of 2.45 percent for finance during construction (FDC) is included at an aggregate level in calculating the Regulatory Investment Value for each EDB. This Regulatory Investment Value is then used to calculate the ROI.

investments. Instead, adjustments such as using up-to-date MEAs and replacement costs would allow EDBs to recover changes in costs that have occurred since 2004, and were not faced by the EDB either then, or when the assets were installed.

E2.44 Such changes would result in significant upward changes in the valuations, without any clear benefit in s 52A(1)(a)–(d) terms. For example, PwC and SKM on behalf of ENA developed a proposed updated 2010 ODV handbook.⁵⁷⁷ The Commission has estimated the potential effect of PwC and SKM's proposed updated replacement costs across the electricity distribution sector. Conservatively, the Commission estimates that the minimum overall uplift in value would be around 32 percent, against the ODV value for all EDBs as at 31 March 2004. This equates to an increase in value across the sector, for no investment outlay, of about \$1.9 billion. This assessment is an estimate only, based on changes in the value of standard fixed assets, using the proposed lowest percentage replacement cost change for each asset class, provided by PwC and SKM.⁵⁷⁸

⁵⁷⁷ Electricity Networks Association: *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: PricewaterhouseCoopers, SKM ODV Handbook Report: prepared for Electricity Networks Association, 20 August*

⁵⁷⁸ This analysis was based on using the percentage changes in EDB standard unit replacement costs from 2004 to 2010 (after netting off the cumulative effect of changes in the CPI from 2004–2010), which are provided in the final column of Appendix D of the PwC and SKM submission (Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: PricewaterhouseCoopers, SKM ODV Handbook Report: prepared for Electricity Networks Association, 20 August 2010*), and applying these changes to 2004 ODV data, disaggregated by asset groups. The disaggregated data is from the individual ODV valuation reports disclosed by all EDBs as at 31 March 2004 (with the exception of Westpower). The total of the ODVs as at that date for all EDBs is \$5.8b (note, after rounding, the inclusion of data for Westpower has no material effect on this total, and no material effect on the uplift calculation). The aggregated version of this data (which includes Westpower) is available in the published spreadsheet as presented in: <http://www.comcom.govt.nz/assets/Imported-from-old-site/industryregulation/Electricity/ElectricityInformationDisclosure/ContentFiles/Documents/comcom-summaryandanalysis spreadsheet2004.xls>.

The disaggregated 2004 ODV data was categorised into the following asset groups: overhead distribution assets (poles & wires); underground distribution assets (cables); overhead subtransmission assets (poles and wires); underground subtransmission assets (cables); subtransmission substations (including transformers); distribution substations (including transformers); other (including system control); overhead service connections; underground service connections; overhead low voltage lines; underground low voltage lines; streetlighting; other common system fixed assets; and others. Each asset class line item from PwC/SKM's Appendix D was matched to the appropriate 2004 ODV asset group. For example, each type of 22kV and 11kV cable from p 22 of Appendix D was matched to the 'underground distribution assets' group. The lowest and highest percentage changes from the asset class line items in Appendix D that were matched with each of the 2004 ODV asset groups, were applied as the minimum and maximum percentage changes to the 2004 ODV valuations for each asset group of each EDB (note that nil percentage changes were applied to the asset groups of 'streetlighting, other common system fixed asset, and other (including system control), as there was no corresponding percentage change data in Appendix D, therefore making the overall estimates more conservative). Only minimum and maximum percentages were used, because the data to determine a weighted average percentage change, based on the value of each line item in the ODV is not available. For example: PwC's/SKM's asset class of 'Distribution Lines & Cables - Lines' includes 20 line items that correspond to the 2004 ODV asset group of 'overhead distribution assets (poles & wires)'. The lowest percentage change in those line items is 53%, for Medium & Light Double Circuit 22kV Lines and Heavy & Medium Double Circuit 11kV Lines, and the highest percentage change is 74%, for Heavy Underbuilt 22kV Lines. (The equivalent minimum and maximum percentage changes, without netting off CPI-indexation, are 80% and 106%, respectively).

The minimum and maximum percentage changes mapped to each asset group were applied to the 2004 ODV data to estimate the overall minimum and maximum valuations for that asset group for each EDB in 2010 (ignoring capital expenditure and depreciation since 2004). These results were then summed to get the estimated total minimum and maximum 2010 valuations across all the EDBs. The overall maximum and minimum percentage changes in ODV valuation from 2004 to 2010 were then calculated. The minimum change in the sum of the disaggregated 2004 ODV data was a 32 percent increase (i.e. \$1.9 bn), and the maximum change was 133 percent, above the original total asset value for all EDBs of \$5.8b. The actual change in the overall standard asset value, if PwC/SKM's proposed replacement costs were applied, would be somewhere between the minimum 32 percent and maximum 133 percent,

- E2.45 The last consideration in paragraph E2.10d, the use of a piecemeal/incremental construction assumption, rather than a significant scale of construction assumption, relates to a key concern EDBs have expressed in the past in relation to the ODV approach. A number of parties have submitted, in relation to the IM for the valuation of assets and under the previous regulatory regime⁵⁷⁹ that the approach set out in the 2004 ODV Handbook is incorrect, in that standard replacement costs in the 2004 ODV Handbook do not reflect EDBs' actual incremental costs of replacing assets. Some submitters assert that resulting valuations may reduce investment incentives.⁵⁸⁰
- E2.46 Such concerns are effectively an argument against the principles underpinning the ODV approach itself, rather than the specific replacement costs and other assumptions contained in the 2004 ODV Handbook. One of the key principles and assumptions underpinning the ODV approach is that the value of a network should reflect the costs of a hypothetical new entrant constructing a hypothetical replacement network. Applying this principle, the 2004 ODV Handbook uses modern equivalent assets (as at 2004), not actual assets, and a significant scale of construction, rather than construction on an incremental or piecemeal basis.
- E2.47 During consultation on IMs, PwC and Mr Wilson (on behalf of Powerco) accepted that the ODV approach must be based on an appropriate scale of construction, not on incremental investment values.⁵⁸¹
- E2.48 Accordingly, the Commission does not consider adjustments to update standard replacement costs and related assumptions in the 2004 ODV Handbook, or to use incremental cost-based replacement costs instead, are either required by, or consistent with, the Part 4 Purpose.

Adjustments for GPBs

- E2.49 The IM Determinations for GDBs and GTBs permit a more limited set of adjustments than those applying to EDBs.
- E2.50 Some submitters have argued that permitted adjustments are insufficient. For example, Vector argued that further adjustments are required for GPBs, and, in particular that the IM Determinations for GPBs, as for EDBs, should include:⁵⁸²

and likely to correspond to an uplift significantly more than \$1.9 billion. Although, as noted above, these estimates do not take into account the percentage change in ODV weighted by the value of each line item in PwC/SKM's table, the use of the disaggregated 2004 ODV data means that the estimates are weighted by the 2004 ODV value of each asset group for each EDB.

⁵⁷⁹ For example: Wellington Electricity Lines Limited *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses) Determinations and Draft Reasons Papers*, 20 August 2010, pp. 5-12, paragraphs 2.2-2.2.5.

⁵⁸⁰ See Commerce Commission, *Input Methodologies (Electricity Distribution Services) Draft Reasons Paper*, paragraphs 4.4.43 to 4.4.54 for a more detailed discussion.

⁵⁸¹ PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 14, paragraph 31; Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: Wilson, Cook and Co Limited, Commerce Commission and Regulatory Asset Bases for Electricity Distribution and Gas Pipeline (Distribution) Businesses: Expert statement for Powerco Limited*, 20 August 2010, pp. 27-28, paragraphs 87-92.

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- a. a clause allowing the application of multipliers that had not previously been applied; and
 - b. a clause allowing the reversal of optimisation.
- E2.51 There are fewer grounds to allow adjustments for GPBs than is the case for EDBs. With the exception of assets subject to the Gas Authorisation, GPBs have not been subject to any mandatory asset valuation methodology. GPBs have thus had greater flexibility than EDBs in the way in which they have undertaken valuations (for example in choosing and applying multipliers). Further, GPBs have had the freedom to determine when to update their revaluations.
- E2.52 With respect to assets covered by the Gas Authorisation, initial RAB values will be based on initial RAB valuations for Powerco and Vector (Auckland) established as at 30 June 2005 under the Authorisation. Given that Powerco and Vector (Auckland) have been subject to control under the Commerce Act, the Commission considers it more appropriate to use valuations underlying those control terms (after rolling them forward for capital additions/disposals, depreciation and CPI-indexation) than values disclosed under the Gas (Information Disclosure) Regulations 1997 (Gas ID Regulations).
- E2.53 This section discusses the merits of the following types of adjustments to GPBs' disclosed asset values, in light of submissions received and the prior treatment of valuations in the gas pipeline business sector:
- a. correction of errors;
 - b. adjustments to ensure the initial RAB value includes (only) assets used to provide gas pipeline services, as defined by s 55A; and
 - c. CPI-indexation of Vector's NGC Distribution and NGC Transmission asset values.

Correction of errors

Approach

- E2.54 GPBs may adjust disclosed 2009 values to correct for known errors in the asset register as at the initial RAB date. This includes the following types of corrections:
- a. assets omitted or included in error;
 - b. assets included but allocated to the incorrect asset category;
 - c. assets included with incorrect ages; and
 - d. assets where estimates were made about quantity, age, category or location of the asset which are now known to be incorrect.

⁵⁸² Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 69, paragraph 201 and p. 79.

E2.55 Asset inclusions and value corrections are achieved as follows:

- a. assets omitted in error: assets omitted in error are assets that should have: (i) been included in the most recent asset revaluation undertaken by the GPB for the purpose of the Gas ID Regulations (other than a revaluation for CPI-indexation), or (ii) been added in rolling forward the asset value since that revaluation (consistent with the Gas ID Regulations). For these assets, the initial RAB value as at the end of the 2009 disclosure year should be established using the valuation approach applied by the supplier in making disclosures under the Gas ID Regulations, applying a particular revaluation methodology, if applicable. The value should then be rolled forward for depreciation, and CPI indexation if indexation was applied by the GPB in making disclosures under the Gas ID Regulations (for NGC assets CPI indexation should apply from 2005, see below); and
- b. modified value assets: These are assets that were included in the most recent asset revaluation undertaken for the purpose of the Gas ID Regulations, or in subsequently rolling forward the asset base, but were incorrectly recorded. Their initial RAB value as at the end of the 2009 disclosure year should be established by taking the value that should have applied under disclosures made under the Gas ID Regulations had the asset been correctly recorded, and rolling that value forward to the last day of the 2009 disclosure year taking account of depreciation, and CPI-indexation if indexation was applied by the GPB in making disclosures under the Gas ID Regulations.

As noted above, for the purpose of these adjustments, the most recent asset revaluation undertaken for the purpose of the Gas ID Regulations means revaluations other than those to provide for CPI-indexation.

E2.56 The above adjustments do not apply to assets covered by the Gas Authorisation.

Reasons

E2.57 This provision deals with corrections to the 2009 disclosed asset valuations for GPBs not covered by the Gas Authorisation by allowing GPBs to:

- a. include assets that should have been included in those valuations, but were not; and
- b. correct the value of assets that were included based on incorrect information.

The inclusion of any assets that were not eligible to be included in the most recent valuation undertaken for the purpose of the Gas ID Regulations (other than revaluations to provide for CPI-indexation), but which nevertheless fall within the definition of gas pipeline services in s 55A of the Act, are addressed in the following section.

E2.58 Gas sector submitters supported permitting asset register corrections.⁵⁸³ In the context of EDBs, PwC on behalf of ENA noted that regulated suppliers should be

⁵⁸³ GasNet Limited: *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 10, paragraph 37.

- permitted to correct for all known errors; corrections should not be limited to omissions or errors found during valuation or disclosure audits.⁵⁸⁴ This proposal applies equally to GPBs.
- E2.59 The 2005 initial RAB valuations for Powerco and Vector (Auckland), under the Authorisation, were subject to an extensive consultation process. The process involved a number of changes to the regulatory valuations existing at the time.⁵⁸⁵ In light of this, and given the subjectivity of replacement cost-based valuations, the Commission considers there is no justification for significant adjustments to valuations to these particular GPBs. These valuations can be considered as effectively ‘locked in’ already.
- E2.60 However, as set out in paragraphs E2.54 and E2.55, GPBs not covered by the Authorisation will have an opportunity to correct errors in their asset registers, as part of the process of establishing their initial RAB values.
- E2.61 Mr. Duncan Head, on behalf of Vector, raised a number of concerns regarding the quality of the 2003 ODV valuations of the NGC assets, noting that, following Vector’s acquisition of NGC in 2005, it deemed NGC’s asset information to be “of insufficient quality for valuation purposes”.⁵⁸⁶ Mr. Head listed a number of shortcomings in the NGC valuations, including various omissions of assets used to provide gas pipeline services.⁵⁸⁷ Mr. Head stated that, in his opinion, trying to implement fixes to these historical valuations will be extremely difficult and costly. In order to get the information to make these changes a new asset register will have to be prepared as a starting point.⁵⁸⁸
- E2.62 Mr. Wilson, on behalf of Vector, also submitted that adjustments to initial RAB values for GPBs should allow for the correction of errors generally in the NGC valuations, including corrections for assets omitted in error.⁵⁸⁹ Mr. Wilson recommended all errors discovered to have existed in the 2003 valuations ought to be corrected (and found assets incorporated) in initial RAB values.⁵⁹⁰
- E2.63 The adjustments provided for in the IM Determination, described in paragraph E2.54 will go some way towards addressing the concerns raised by Mr. Wilson and Mr. Head. The Commission acknowledges Mr. Head’s submissions that, in order to implement these corrections, a new asset register may need to be created as a starting point, but notes that such would also be the case if a new ODV revaluation were undertaken for 2009 or 2010 (which is what these submitters advocate). The

⁵⁸⁴ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: PricewaterhouseCoopers, IDV Corrections Report: prepared for Electricity Networks Association, 20 August 2010*, p. 6.

⁵⁸⁵ Refer: Commerce Commission, *Gas Authorisation Final Decisions*, 30 October 2008, paragraphs 388, 411–413, 437–443.

⁵⁸⁶ Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper, Attachment: Statement of Duncan Ian Head, 23 August 2010*, paragraphs 4.15 to 4.16.

⁵⁸⁷ *ibid.* paragraph 6.8.

⁵⁸⁸ *ibid.* paragraph 6.11.

⁵⁸⁹ Vector Limited, *Submission on EDBs and GPBs Revised Input Methodologies Draft Determination, Attachment: Supplementary Statement of Jeffrey Webster Wilson, 19 November 2010*, paragraphs 49-62.

⁵⁹⁰ *ibid.* paragraphs 65-66.

IM Determination requires regulated suppliers, in establishing their initial RAB values, to establish RAB values for their assets on a disaggregated basis. This will require regulated suppliers to revisit, and possibly recreate, asset registers to ensure that assets in the RAB are clearly defined and assigned a RAB value. Beyond this, given the potential for additional compliance costs, the adjustment for errors in the existing regulatory valuations is on a voluntary basis.

- E2.64 Where corrections are made to asset registers up until 2009 for the purposes of the Gas ID Regulations, the corrections should be in line with the valuation rules and methodology that were applied by the regulated supplier in making disclosures under those requirements at the time. Accordingly:
- a. for assets that should have been included in the most recent revaluation undertaken by the GPB for the purpose of the Gas ID Regulations the GPB must:
 - i. establish a value for the asset using the same revaluation methodology that was applied to the rest of the asset base at the time of the most recent asset revaluation for the purpose of the Gas ID Regulations (e.g. the ODRC or ODV methodology applied at the time); and
 - ii. roll forward the value of the asset to the end of the 2009 disclosure year, consistent with other assets disclosed under the Gas ID Regulations;
 - b. for assets commissioned since the date of the most recent revaluation, but not included in the disclosure values, the GPB must establish a value for the asset as at its commissioning date, and roll that value forward to the end of the 2009 disclosure year, consistent with the requirements of the Gas ID Regulations; and
 - c. For assets that were included in the 2009 disclosure values, but were incorrectly recorded, the GPB must:
 - i. establish the correct value by taking the value that would have applied under the Gas ID Regulations had the asset been correctly recorded. For assets that were commissioned on or before the date of the most recent revaluation undertaken for the purpose of the Gas ID Regulations, this value should be established using the same revaluation methodology the GPB used for its most recent revaluation undertaken for disclosures under the Gas ID Regulations. For assets commissioned since the most recent revaluation undertaken for the purpose of the Gas ID Regulations the value should be established consistent with disclosures made under the ID Regulations; and
 - ii. roll the value established under (a) forward to the last day of the 2009 disclosure year, consistent with other assets disclosed under the Gas ID Regulations.
- E2.65 As discussed below, Vector may adjust the value of assets owned by NGC to provide for CPI-indexation from the beginning of the 2006 disclosure year consistent with the method employed by the Commission in the Gas Authorisation. Where Vector either includes, or modifies the value of, assets that were owned by

NGC, it is similarly able to apply CPI-indexation to these assets' value from the beginning of the 2006 disclosure year.

Inclusions and exclusions of assets as defined by s 55A

Approach

- E2.66 In order to ensure that assets used to provide gas pipeline services, as defined in s 55A, are included in the initial RAB, GPBs may include in the initial RAB value the value of any assets that were not permitted to be included in existing regulatory values, pursuant to the Gas ID Regulations, but which were nevertheless used to provide gas pipeline services (as defined in s 55A) in the 2009 disclosure year.
- E2.67 Assets included on this basis should be brought into the RAB value at depreciated historic cost or, where information is not available to derive the DHC value, at book value as provided for in the businesses' audited general purpose financial statements.
- E2.68 The IM Determinations require GPBs to exclude from the initial RAB value the value of any assets that are included in the 2009 disclosed asset values, or in the 2005 authorisation valuations for Powerco and Vector (Auckland), that are not used to supply gas pipeline services as defined by s 55A, as part of the rules for determining the composition of the initial RAB.

Reasons

- E2.69 Any adjustment from applying the definition of gas pipeline services under s 55A to the initial RAB value should allow for both inclusions and exclusions, and this is reflected in the IM Determinations. However, similarly to EDBs,⁵⁹¹ the Commission does not consider a detailed definition of the boundary between gas pipeline services and other services (for example with reference to specific asset types) is either desirable or warranted. GPBs have never been subject to a single defined set of valuation rules or principles. For GPBs not covered by the Gas Authorisation, there has never been a mandatory set of requirements. Accordingly, valuation practices vary between GPBs. In particular, existing regulatory valuations exclude assets that are used to provide gas pipeline services, and accordingly should be included in the RAB value under Part 4. For example, Mr. Head, on behalf of Vector, submitted that the 2003 ODV valuations of NGC assets "omitted assets that are allowed under the handbook methodologies".⁵⁹² The IM Determination will give GPBs an opportunity, at the time they establish their initial RAB values, to include in the RAB value assets used to supply gas pipeline services that were not included in their 2009 disclosed regulatory values.
- E2.70 Where documentation to support a DHC value is not available, GPBs may establish RAB values for such assets using existing values from audited general purpose financial statements. The risk associated with this approach is low, and is offset by the reduction in compliance costs. No specific submissions were received on this topic in relation to GPBs.

⁵⁹¹ See paragraphs E2.10 to E2.36.

⁵⁹² Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper*, Attachment: *Statement of Duncan Ian Head*, 23 August 2010, paragraph 6.8(b) and (c).

CPI indexation of Vector's NGC Distribution and NGC Transmission asset values

Approach

- E2.71 The IM Determinations allow Vector to index the value of its NGC Distribution and NGC Transmission assets, using the CPI, from the first day of the disclosure year 2006 (i.e. 1 July 2005).
- E2.72 Vector may also apply this indexation from the first day of the disclosure year 2006, to the changes permitted under the asset adjustment process for the initial RAB value, specifically to the following changes in the value of its NGC Distribution or NGC Transmission assets:
- a. inclusion of an asset that was eligible to have been included in the most recent revaluation undertaken for the purpose of disclosures under the Gas ID Regulations, or subsequently added in rolling forward the RAB, but was omitted;
 - b. modification of the value of an asset which was allocated to the incorrect asset category, or was given a value based on an estimation of quantity, age, category or location that is now known to be incorrect; or
 - c. inclusion of an asset that was not eligible to be included in the 2009 disclosed financial statements, but is used to provide services that fall within the definition of 'gas pipeline services' in s 55A.
- E2.73 This adjustment must be done by taking the value of the asset from the 2009 disclosed financial statements, or the value otherwise established under the asset adjustment process, and modifying that value to the value that asset would have had, if it had been revalued to take account of changes in the CPI since the first day of the 2006 disclosure year (i.e. 1 July 2005). This CPI adjustment must be made using the same methodology the Commission applied in its 'Gas Control Model' under the Gas Authorisation.

Reasons

- E2.74 The Gas Authorisation allowed the assets of Vector (Auckland) to be rolled forward using CPI indexation from 2005. This treatment is retained under the IM Determinations for GDBs in order to establish the initial RAB value. Vector's NGC Distribution and NGC Transmission assets were not, however, subject to the Authorisation. The Commission notes that there might have been an expectation that, if and when the NGC assets were subject to price-quality regulation, these assets might have been indexed post-2005 in the same manner as the Vector (Auckland) assets. Although not necessary for consistency with the Part 4 Purpose, the Commission considers it is reasonable for Vector to be able to index the value of its NGC Distribution and Transmission assets since 2005, consistent with the Authorisation's approach to valuing Vector (Auckland)'s assets since 30 June 2005.

- E2.75 Vector submitted that indexation of its NGC Distribution and Transmission assets should apply from 2003, not 2005.⁵⁹³ Vector suggested that disallowing any indexation prior to 2005 is retrospective and contrary to s 53P(4).
- E2.76 Disallowing the pre-2005 indexation is not retrospective. Under the Gas Authorisation, Powerco's 2002 ODV and Vector (Auckland's) 2003 ODV were only subject to CPI-indexation from 2005 onward. This is because revaluation gains from CPI-indexation from 2005 were appropriately treated as income under the Authorisation's price-quality path. This does not appear to be the case for revaluations done between 2003 and 2005.

E3 Intangible Assets

Approach

- E3.1 All regulated suppliers may include in their RAB values finance leases and intangible assets, provided that they are identifiable non-monetary assets that are not goodwill, consistent with the meanings under GAAP. Accordingly, regulated suppliers must exclude working capital, and goodwill from their RAB values.
- E3.2 Regulated suppliers must establish the value of permitted intangible assets as follows:
- a. for intangible assets in the initial RAB value, using the value ascribed to those assets in the EDBs' and GPBs' 2009 disclosures, as applicable;
 - b. for intangible assets added to the RAB value after the initial RAB date using the cost model for recognition, under GAAP.⁵⁹⁴

Reasons

- E3.3 Intangible assets are best defined as "identifiable non-monetary assets without physical substance".⁵⁹⁵ Examples include computer software, patents, copyrights, and franchises. Regulated suppliers may expend resources on acquiring or developing, maintaining or enhancing such assets, and should be able to earn a return of and on that investment where:
- a. this is consistent with the Part 4 Purpose; and
 - b. the assets are used to supply electricity distribution services or gas pipeline services (it is not sufficient for intangible assets to merely be associated with an EDB or GPB).
- E3.4 GAAP (through the accounting standard NZ IAS 38) provides that an intangible asset can only be recognised if, and only if, it meets the following criteria:⁵⁹⁶

⁵⁹³ Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 69, paragraph 201.

⁵⁹⁴ See accounting standard NZ IAS 38, paragraph 24.

⁵⁹⁵ NZ IAS 38, paragraph 8.

⁵⁹⁶ NZ IAS 38, paragraphs 12, 21-22.

- a. it is capable of being separated or divided from the entity and sold, transferred, licensed, rented or exchanged, either individually or together with a related contract, asset or liability, or arises from contractual or other legal rights; and
 - b. it is probable that future economic benefits that are attributable to the asset will flow to the entity and the cost of the asset can be measured reliably.
- E3.5 NZ IAS 38 requires intangible assets to be measured initially at cost. The standard prohibits the recognition of internally generated brands, publishing titles, customer lists and items similar in substance from being recognised as intangible assets. In these cases, there is no reliable way of measuring the costs (if any) to the supplier of investing in these items.
- E3.6 The Commission considers that the criteria set out in paragraph E3.4 are consistent with the Part 4 Purpose, specifically s 52A(1)(d). By applying these criteria, EDBs and GPBs can expect to earn normal economic returns over the lifetimes of assets which reflect actual costs (identifiable and measured reliably) of providing services to consumers in an efficient manner. The criteria set out in the standard therefore provide a useful guide in determining the value of the intangible assets that should be permitted to enter the RAB value under Part 4.
- E3.7 Those parties who submitted on this topic supported the Commission's approach.⁵⁹⁷
- E3.8 The sections that follow discuss the required treatment of specific categories of intangible asset—goodwill, working capital, and finance leases.

Goodwill

- E3.9 Goodwill arises from business acquisitions, where a business is acquired from another supplier for a price which is greater than the fair value of the assets of the business at the time of the acquisition. The difference is usually attributed to 'goodwill' and is recognised in the financial statements of the acquirer as an asset.⁵⁹⁸ Goodwill is an intangible item and represents the acquirer's anticipation of future economic benefits from assets where such benefits are not capable of being individually identified and separately recognised.
- E3.10 In markets subject to workable competition suppliers are generally unable to earn an additional rate of return simply as the result of the goodwill included in their payments to acquire assets. Even if such payments were justifiable, the process of separating out the portion of those payments which reflect specific factors (such as potential efficiency gains) would be subjective and arbitrary. Further, the inclusion of goodwill in the RAB value may encourage inefficient consolidations. Excluding

⁵⁹⁷ GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 11, paragraph 42; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 16, paragraph 38; Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, pp. 34-35, paragraphs 155-156.

⁵⁹⁸ It is important to distinguish between the 'fair value' of the assets of the business, and the 'fair value' of the business enterprise as a whole (that is the price a purchaser is willing to pay for the business), which may be greater. Accounting Standard NZ IFRS 3 provides guidance on the recognition of goodwill for 'business combinations', paragraphs 51-55.

goodwill from the RAB value will help to produce outcomes consistent with those observed in workably competitive markets, and will promote the long-term benefits of consumers accordingly. All regulated suppliers must therefore exclude goodwill from their RAB values. Parties who submitted on this topic supported the Commission's approach.⁵⁹⁹

- E3.11 The Commission recognises that preserving incentives for EDBs and GPBs to make efficiency savings, including through mergers or acquisitions involving other regulated suppliers, is consistent with s 52A(1)(b). Including goodwill in the RAB value, however, is not an appropriate way to achieve this outcome. Instead, the Commission's approach is to:
- a. allow EDBs and GPBs to keep potential efficiencies from mergers or acquisitions by not re-opening the price-quality path set by a DPP or a CPP during the regulatory period in which the merger occurs; and
 - b. implement an incremental rolling incentive scheme under the CPP (explained in Section 8.5), which will allow EDBs and GPBs to retain the full benefits of efficiency gains for five years. Efficiency gains, including those associated with the transaction, will be shared with consumers over time, commencing as part of starting price adjustments at the beginning of each regulatory period.

Working capital

- E3.12 Some parties submitted that working capital should be included in the RAB value.⁶⁰⁰ PwC argued that this would be consistent with the cash flow items already determined in deriving the annual financial disclosures, and would be consistent with GAAP. GasNet also argued that working capital is an asset that is needed to supply specified gas pipeline services, and so should be included.⁶⁰¹ GasNet stated that working capital is already measured for financial reporting purposes and can be included in the RAB value accordingly (without the Commission developing specific 'rules' for it).
- E3.13 In considering whether to include working capital in the RAB value, the Commission has defined working capital as the liquidity a business needs to meet its short term obligations. This is net working capital, i.e. current assets less current liabilities. Overall, including working capital in the RAB value is unlikely to have a material effect on the ROI, and therefore is unlikely to have a substantial benefit in terms of meeting the Part 4 Purpose, or the purpose of information disclosure. The Commission's reasons for this view are:

⁵⁹⁹ GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 11, paragraph 42; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 16, paragraph 38; Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, pp. 34-35, paragraphs 155-156.

⁶⁰⁰ For example: PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, pp. 17-18, paragraphs 40-47; Orion, *Submission on IM Discussion Paper*, 14 August 2009, p. 21. Powerco, *Submission on IM Discussion Paper*, 14 August 2009, p. 22.

⁶⁰¹ GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 11-12, paragraphs 43-44.

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- a. for consistency with the Part 4 Purpose (in particular s 52A(1)(b)), the IM for the valuation of assets should preserve regulated suppliers' incentives to manage their working capital efficiently. The Commission's approach retains incentives to manage working capital efficiently, as it will not be compensated where working capital is unduly high (and conversely will not be penalised where working capital is low or negative);
 - b. working capital is concerned with the timing of cash flows required to provide the regulated services. Regulated suppliers will, in effect, be compensated for the effects of cash flow shortfalls, if any, during capex programmes which involve periods of intensive cash usage.⁶⁰² The Commission considers this reduces the effect of excluding working capital from the RAB value—even if working capital were included in the RAB value, it would be net of this large sum;
 - c. excluding working capital prevents regulated suppliers from including current assets in the RAB value, but also excludes the offsetting effect of current liabilities.
- E3.14 While businesses may already have their own processes in place for measuring working capital, there is no specific GAAP definition or treatment of working capital. For example, current liabilities included in working capital are a subset of term liabilities which are defined under GAAP. Further, in practice businesses share working capital across all of their operations. If regulated suppliers were permitted to include working capital in their RAB values, they would need to allocate it between regulated services and other parts of the business. Thus in order to provide certainty for regulated suppliers, and other interested persons, the Commission would need to develop rules for defining and allocating working capital.
- E3.15 The above drawbacks are not insurmountable. However, it is difficult to justify the added regulatory costs of including working capital in the RAB value, as the benefit from doing so, in terms of the Part 4 Purpose and the purpose of information disclosure, is likely to be immaterial.
- E3.16 The exclusion of working capital is implemented in the IM Determination by excluding intangible assets from the RAB value, unless they are both identifiable and not monetary. As working capital is an intangible asset that is monetary, regulated suppliers must exclude working capital from their RAB values.

Finance leases

- E3.17 GAAP (accounting standard NZ IAS 17) provides for 'finance leases' to be treated in a similar way to fixed assets and corresponding term liabilities even though the recognised finance lease asset can arguably remain an intangible. In this context,

⁶⁰² The IM Determination allows regulated suppliers to capitalise the cost of finance during the construction of new assets and to include this in the RAB value once new works are commissioned. This allows regulated suppliers to earn a return on the cash payments made to suppliers when constructing new assets (see paragraphs E5.8 to E5.24).

‘finance leases’ are leases where substantially all the risks and rewards incidental to ownership are passed to the lessee for the term of the lease.⁶⁰³

- E3.18 The Commission considers there is potential benefit in allowing EDBs and GPBs to recognise finance leases, in accordance with the standard. It can be efficient for EDBs and GPBs, in planning future additions, to choose leases over the option of owning the asset, where this minimises costs over the asset’s life. This outcome is consistent with what would be expected in a workably competitive market, and with s 52A(1)(b) of the Act. Failing to recognise finance leases in the RAB value could penalise EDBs and GPBs for such efficiency enhancing behaviour. The Commission therefore considers it appropriate to apply the treatment under NZ IAS 17 for finance leases. Hence EDBs and GPBs are permitted to include finance leases in the RAB value, consistent with GAAP (specifically NZ IAS 17). GasNet supported this approach.⁶⁰⁴

E4 Additions and Disposals

Approach

- E4.1 Subject to any other decisions on specific types of transaction, all regulated suppliers must include capital additions in the RAB value at cost in the year in which they are ‘commissioned’. For this purpose the term ‘commissioned’ for new capital expenditure is defined to mean first ‘used by an EDB to provide electricity distribution services’, ‘first used by a GDB to provide gas distribution services’, or ‘first used by a GTB to provide gas transmission services’ (as applicable).
- E4.2 Where the cost of a network spare is treated as the cost of an asset under GAAP (wholly or in part), it may be added to the RAB value at the date on which it is ‘commissioned’. All regulated suppliers should include network spares in the roll forward as additions to the RAB value where they are held in appropriate quantities, considering the historical reliability of the equipment and the number of items installed on the network.
- E4.3 Where a regulated supplier disposes of an asset, the closing RAB value of that asset, for the disclosure year in which the disposal occurs, is nil. Section E8, below, discusses treatment of asset sales between regulated parties and related parties.

Reasons

- E4.4 The requirement that a new asset must be ‘used’ in the definition of ‘commissioned’ is a practical way of ensuring that only assets that are used to provide electricity distribution services or gas pipeline services are included in the RAB value. Whether an asset is ‘used’ is a purely factual matter within the knowledge of EDBs and GPBs, which can be objectively assessed by regulated suppliers and interested parties.

⁶⁰³ A finance lease may provide for ownership of the asset to pass to the lessee at the end of that period. The term ‘finance’ reflects the fact that this type of lease is essentially a financing arrangement that may lead to the acquisition of an asset. Vehicles and IT equipment are examples of assets where such leases might be used.

⁶⁰⁴ GasNet Limited, *Input Methodologies (Gas Pipeline Services) Draft Reasons Paper and Draft Determinations*, 9 August 2010, p. 11, paragraph 45.

- E4.5 The Commission's definition of commissioning will enable EDBs and GPBs to bring a new asset into the RAB value, regardless of whether the asset is currently used to its full capacity. Thus, where EDBs and GPBs build assets with greater capacity than is currently required in anticipation of future demand growth, they will not be penalised for this. This was supported by PwC.⁶⁰⁵ The Commission anticipates that it will consider whether planned investments by EDBs and GPBs are prudently sized when in considering CPP applications.
- E4.6 Orion noted that, if the Commission adopted an approach of 'locking in' the initial RAB value, it would need to make decisions on the application of *ex ante* and/or *ex post* prudence tests for new capital expenditure.⁶⁰⁶ The Commission considers it appropriate that there be no *ex post* reviews of investments, nor does it propose any *ex post* efficiency reviews of investments when setting DPPs. *Ex post* reviews that result in a write-down of the RAB may reduce the incentives for investment.
- E4.7 The Commission considers that efficiency reviews of capital expenditure may be appropriate under information disclosure regulation. The requirement for EDBs to disclose asset management plans (AMPs) under the existing information disclosure requirements provides a useful discipline on the prudence of EDBs' capital expenditure. Under information disclosure requirements to be set under Part 4, the Commission is considering continuing the requirement for AMPs for EDBs, and introducing similar requirements for GPBs. These reviews will not affect asset values but will assist interested persons in assessing if prudent and efficient capital expenditure is occurring, thereby providing incentives for regulated suppliers to make prudent investments. The Commission will be consulting on ID requirements in more detail in 2011.
- E4.8 *Ex ante* efficiency reviews do have a role in assessing CPP proposals. The Commission may review the efficiency of a supplier's planned capital expenditure, (prior to the investments being made) when considering an appropriate CPP to set for a supplier that has proposed an alternative price-quality path to better meet its particular circumstances. Although actual rather than planned capital expenditure is subsequently rolled into the RAB, once the CPP is set it will only flow into prices at the next DPP/ CPP reset. Therefore incentives for investment will be retained while the benefits of efficiency gains will be shared at each reset.
- E4.9 Allowing regulated suppliers to include in the RAB roll forward network spares that are suitable replacements for assets installed in the network will provide appropriate incentives for suppliers to hold sufficient spares to enable suitable responses to unplanned outages and to undertake maintenance efficiently. This must be balanced by ensuring that suppliers are not encouraged to hold an inappropriately high number of spares. GasNet supported including additions and disposals which affect the spares balance in the annual adjustments to RAB value.⁶⁰⁷

⁶⁰⁵ PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 21, paragraphs 59-60.

⁶⁰⁶ Orion, *Input Methodologies Draft Determinations Submission on Asset Valuation*, 19 August 2010, pp. 9-10, paragraph 7.24.

⁶⁰⁷ GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 12-13, paragraphs 46-47.

E4.10 The 2004 ODV Handbook for electricity lines businesses provided that spares held in stock that can be used in the network in place of existing network assets may be included in the valuation to the extent that the quantities of items included in the valuation are appropriate, considering the historical reliability of the equipment and the number of items installed on the network. The Commission considers this is a reasonable criterion for determining the level of network spares that may be included in the RAB value for either EDBs or GPBs.

E5 Works Under Construction

Approach

- E5.1 Regulated suppliers must exclude any asset that is part of works under construction from their RAB values. Regulated suppliers must capitalise the financing costs attributable to the construction of an asset in accordance with GAAP,⁶⁰⁸ and cease capitalising financing costs at the point at which the asset is commissioned.⁶⁰⁹ Consistent with GAAP, EDBs and GPBs must suspend capitalising financing costs during periods in which they suspend construction of the asset.
- E5.2 Non-exempt EDBs and GPBs must calculate the financing costs, for the purpose of both information disclosure and CPPs, by applying to the amounts expended on the construction of the asset a rate no greater than the regulatory post-tax weighted average cost of capital (post-tax WACC), specifically the 75th percentile for the post-tax estimate of WACC, published by the Commission, determined under the cost of capital IM. For exempt EDBs, that is EDBs subject to information disclosure only, the applicable rate is one that is no greater than the EDB's own estimate of its post-tax WACC.
- E5.3 When works under construction are commissioned, the RAB value of the asset must be net of any revenue earned. That is, regulated suppliers must reduce the cost of the asset, established consistent with GAAP, by the amount of any revenue derived in relation to the assets while they were works under construction (where such a reduction is not already made under GAAP, and where the revenue has not already been reported as income under information disclosure).

Reasons

- E5.4 In reaching its conclusions about the treatment of works under construction the Commission has considered the following key issues:
- a. the timing of the inclusion of capital and financing costs in the RAB value; and
 - b. how to quantify financing costs.

⁶⁰⁷ Genesis Energy Limited *Input Methodologies – Gas Pipeline Services* 6 August 2010, p. 2.

⁶⁰⁸ The relevant accounting standard is New Zealand Equivalent to International Accounting Standard 23 Borrowing Costs as updated from time to time, or any equivalent standard that replaces that standard under Generally Accepted Accounting Practice.

⁶⁰⁹ Paragraph E4.1 sets out the definition of 'commissioned' under the IM Determination.

Timing of inclusion of financing costs

- E5.5 In workably competitive markets, assets that have not been commissioned would not normally be expected to earn a return on the capital expended.⁶¹⁰ The Commission's approach is therefore to allow EDBs and GPBs to include capex along with financing costs incurred during construction in the RAB value from the time the asset is commissioned. This approach is consistent with GAAP. Under GAAP (NZ IAS 23), finance costs are calculated from the 'commencement date' to the date at which 'substantially all the activities necessary to prepare the qualifying asset for its intended use or sale are complete'.⁶¹¹
- E5.6 All submitters that commented on this issue agreed with the proposal to recognise an allowance for finance costs for works under construction either at the time the assets are commissioned, or at a substantially similar time under the applicable NZ IAS 23 treatment.⁶¹²
- E5.7 Accordingly, the Commission has adopted the 'commissioning' date as the appropriate point to allow capitalised financing costs for assets under construction to enter the RAB value as part of the total cost of the commissioned asset.⁶¹³

Quantification of financing costs

- E5.8 The financing of assets under construction contributes to suppliers' overall costs of creating or replacing the assets used to provide electricity distribution services or gas pipeline services. For regulatory purposes, financing costs are usually conceived of as constituting the costs of both debt and equity financing (the firm's cost of capital), with the cost of debt being calculated on a post-tax basis.
- E5.9 In workably competitive markets, suppliers have incentives to complete capital works in a timely and efficient manner. This includes minimising the costs (including financing costs) of completing the works on time, and to a given standard. Promoting improved efficiency is one of the regulatory objectives set out in the Part 4 Purpose (s 52A(1)(b)).
- E5.10 After due consideration, the Commission has concluded that the best option for quantifying financing costs is to apply GAAP—specifically NZ IAS 23 with the minor modifications discussed below.
- E5.11 Adopting GAAP ensures that the regulatory value of newly commissioned assets is consistent with the financial reporting treatment of those assets, thereby reducing compliance costs for suppliers. NZ IAS 23 allows debt costs that are directly attributable to the construction or production of an asset to be capitalised as part of

⁶¹⁰ Commerce Commission, *IM Discussion Paper*, 19 June 2009, paragraph 6.222.

⁶¹¹ Paragraph 17 of NZ IAS 23 defines the commencement date for capitalisation as 'the date when the entity first meets all of the following conditions: (a) it incurs expenditures for the asset; (b) it incurs borrowing costs; and (c) it undertakes activities that are necessary to prepare the asset for its intended use or sale.'

⁶¹² For example: GasNet Limited *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 11, paragraphs 40-41; Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, p. 33, paragraph 147.

⁶¹³ New capex must also be added to the RAB value on the commissioning date, see the discussion of capital additions in Section E4.

- the asset cost.⁶¹⁴ Where debt is specifically acquired for an asset then the borrowing costs are readily identifiable. Where an entity borrows generally (for example, from a central pool of funding) then NZ IAS 23 allows the weighted average of the debt cost to be used for that portion of the funding.
- E5.12 The Commission considers NZ IAS 23 has the following drawbacks in a regulatory context:
- a. eligibility to capitalise finance costs under GAAP depends on the way that capital works are funded (through debt or equity), which may depend on the different practices of different EDBs and GPBs; and
 - b. adopting an NZ IAS 23 treatment, under which actual debt costs are capitalised, may in fact encourage regulated suppliers to find the ‘easiest’ sources of funds to finance new works, irrespective of whether the funds are priced on the most competitive terms.
- E5.13 The Commission has mitigated these drawbacks by adapting the approach in NZ IAS 23. EDBs and GPBs subject to default/customised price-quality regulation must use a financing rate that is no greater than the regulatory post-tax WACC, specifically the 75th percentile for the post-tax estimate of WACC, published by the Commission. Where no WACC has been published with respect to the relevant date, regulated suppliers may use a rate no greater than the suppliers’ own estimate of its post-tax WACC, as at the relevant date.
- E5.14 In the case of exempt EDBs—that is EDBs which are subject to information disclosure only—the IM Determination requires the EDBs to apply their own estimate of their cost of capital in quantifying financing costs. Exempt EDBs do not have to apply a cost of capital established under the cost of capital IM (refer s 53F(1)(b) of the Act, which provides that suppliers that are subject only to information disclosure regulation do not have to apply methodologies for evaluating or determining the cost of capital).
- E5.15 The practical effect of this modification is that regulated suppliers may apply their actual cost of debt, consistent with GAAP, up to the applicable cost of capital.
- E5.16 Submissions on the calculation of financing costs were mixed. For example, GasNet supported the approach of adopting the treatment in NZ IAS 23 and stated that it is an appropriate solution to GasNet’s original proposed alternative of including the work under construction in the RAB value.⁶¹⁵ In contrast, ENA did not support modifications to GAAP with respect to permitted financing costs, on the basis that they will increase compliance costs and are contrary to the principle of EDBs

⁶¹⁴ See: New Zealand Institute of Chartered Accountants, *Borrowing Costs (NZ IAS 23)*, paragraphs 10-15. Paragraph 11 defines debt costs that are ‘directly attributable to the acquisition, construction or production of a qualifying asset’ as ‘those borrowing costs that would have been avoided if the expenditure on the qualifying asset had not been made.’ This is consistent with the meaning of ‘directly attributable’ in the cost allocation IM, albeit focussed at the level of particular assets, rather than services.

⁶¹⁵ GasNet Limited, *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper*, 9 August 2010, p. 11, paragraphs 40-41.

including asset additions at cost in the RAB value.⁶¹⁶ Wellington Electricity agreed with this view.⁶¹⁷

- E5.17 The treatment outlined above may diverge from a strict GAAP application under NZ IAS 23 (and could produce a difference in the cost of new assets in some fixed asset registers). However, the Commission is not persuaded that it will substantially increase compliance costs. EDBs and GPBs will have the flexibility to use actual debt costs, consistent with GAAP, provided these costs do not exceed the regulatory post-tax WACC figure (or the firm's cost of capital, in the case of exempt EDBs). The WACC will be readily available to suppliers and the capitalisation methodology—being substantially similar to that contained in NZ IAS 23—should be well understood. Similarly, exempt EDBs should have existing estimates of their cost of capital which they can use for this purpose. These factors should limit the extent of compliance costs.
- E5.18 Further, the Commission considers the treatment described above will:
- a. allow a full economic cost of financing to be capitalised by EDBs and GPBs (not just the cost of debt) thereby providing a more accurate assessment of profitability;
 - b. incentivise EDBs and GPBs to obtain the most efficient form of debt and equity financing in the circumstances;
 - c. remove the opportunity for EDBs and GPBs to attribute specific tranches of high cost debt to capital projects; and
 - d. avoid the need for standardised multipliers to calculated financing costs.
- E5.19 ENA noted that NZ IAS 23 only provides for borrowing costs to be included for qualifying assets which are defined as an asset which necessarily takes a substantial period of time to get ready for its productive use.⁶¹⁸ This means that EDBs are only able to include borrowing costs where they are material, which will potentially understate the full costs of funding works under construction.
- E5.20 As ENA noted, adopting the treatment set out in NZ IAS 23 allows regulated suppliers to capitalise (and include in the RAB value) borrowing costs only in relation to qualifying assets, that is assets that necessarily take a substantial period of time to get ready for their intended use or sale.
- E5.21 The Commission notes that under GAAP (specifically NZ IAS 23), borrowing costs in relation to other assets must be expensed in the period in which they are incurred, and so should be reflected as part of operational expenditure in the context of

⁶¹⁶ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, p. 34, paragraph 153.

⁶¹⁷ Wellington Electricity Lines Limited, *Submission to the Commerce Commission on Draft Asset Value Input Methodology Decision (Electricity Distribution)*, 20 August 2010, p. 12, paragraph 2.2.6.

⁶¹⁸ Electricity Networks Association, *Submission 7 Valuation Input Methodology Initial Regulatory Asset Base*, 20 August 2010, p. 34, paragraph 154.

information disclosure and CPPs. The Commission considers this treatment will ensure all borrowing costs are treated appropriately under Part 4.

- E5.22 Under information disclosure requirements to be set under Part 4, the Commission anticipates that it will require EDBs and GPBs to disclose information on financing costs for works under construction. This would enable interested persons to assess whether exempt suppliers have incentives to improve efficiency in relation to financing costs by comparing the suppliers' disclosed financing costs to estimated financing costs calculated using the regulatory WACC (as established under the cost of capital IM).
- E5.23 NZ IAS 23 includes a 'suspension' rule under which capitalisation of finance costs is suspended during periods in which active development of the asset is suspended, if these periods are 'extended periods' (i.e. do not involve substantial technical and administrative work and are not a temporary delay necessary for getting the asset ready for use). This 'suspension' rule provides an incentive for suppliers to limit construction time to that strictly necessary for construction. In capitalising financing costs to the RAB value, consistent with GAAP, regulated suppliers should apply this rule.⁶¹⁹
- E5.24 The IM Determination provides that any income earned in relation to assets while they are works under construction must be deducted from the cost of the asset (where such a reduction is not already made under GAAP, and where the revenue has not otherwise been reported as income under information disclosure) for the purpose of establishing its RAB value. This will ensure that the cost of the asset that enters the RAB value on commissioning fully reflects the actual (net) cost to the regulated supplier.

E6 Easements

Approach

- E6.1 All regulated suppliers must include new easement rights in the RAB value at cost in the year in which the rights are acquired, provided that the RAB value of new easement rights does not exceed fair market value, as determined by an independent valuer. The cost of new easement rights are the costs to acquire the rights, together with any associated injurious affection payments and all other costs of establishing the easements, (excluding any costs that are expensed by the EDB or GBP as operating expenditure).
- E6.2 Where a regulated supplier acquires land to create a new easement, with the intention of on-selling the land, only the costs of the easement may be included in the RAB value.
- E6.3 The value of existing easements will be the value for those easements included in each EDB's or GPB's 2009 disclosures. Thus, for EDBs, existing easements will be

⁶¹⁹ The suspension rule would not address situations where EDBs or GPBs progress work, but slowly so as to draw out the period over which financing costs accrue. However, the Commission considers that transparency around capital expenditure plans and actual capital expenditure compared to forecasts should provide interested persons with sufficient information to identify this type of behaviour. The Commission will be consulting in more detail on information disclosure requirements, including any requirements in relation to capital expenditure plans, in 2011.

valued at historic cost in accordance with the 2004 ODV Handbook,⁶²⁰ and indexed forward to 2009.

- E6.4 Regulated suppliers may depreciate easements only where they have a limited life or are required for a known, limited period of time (this applies to existing as well as new easements).

Reasons

- E6.5 An easement is a property right to do something, or to prevent someone else from doing something, usually in a particular geographic area. The costs of creating or acquiring easement rights can form part of the costs of the assets necessary for an EDB or GBP to provide regulated services to consumers.
- E6.6 Regulated suppliers should be entitled to recover reasonable costs of establishing new easements for the purpose of providing regulated services. Providing some limitation on the RAB value of a new easement, will ensure suppliers have incentives to limit these costs. The market value of an easement at the time of its establishment should reflect the reasonable costs to establish the easement rights and therefore is an appropriate measure to use as a limitation on costs. For this purpose the market value includes:
- a. where an EDB or GBP does not own the land over which the easement is being established, legal costs plus any injurious affection payment to the land owner to recognise any reduction in the value of the land attributable to the easement; or
 - b. where an EDB or GBP owns the land over which the easement is being established, legal costs, the amount of any reduction in the value of the land caused by the creation of the easement, and holding costs up to the point that the land is sold or the associated asset is commissioned (whichever occurs first).
- E6.7 With respect to holding costs, the IM Determinations allow regulated suppliers to capitalise holding costs on all monies paid to purchase land for the purposes of creating an easement, up to the date that the easement is created. As discussed above, (see paragraph E5.2) such holding costs may be calculated at a rate no higher than the regulatory WACC published by the Commission or, in the case of exempt EDBs, a rate that is no greater than the EDB's own estimate of its post-tax WACC.
- E6.8 A regulated supplier may face other legitimate costs associated with the construction of new assets. For example, where an EDB or GBP pays compensation to land owners for disruption to their business resulting from construction, it should be able to recover these costs. However, such costs would generally be a cost of construction, not a cost of the easement. As such they should be included in works under construction, consistent with GAAP, and would be capitalised when the newly constructed asset is commissioned. Only costs that are a direct cost of establishing the easement may be included in the value of the easement.

⁶²⁰ See Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Businesses, 30 August 2004, p. 8, paragraph 1.4(c). In situations where compensatory payments were not made for loss of land use or consequential loss existing easements will have a nil value.

- E6.9 Under the Commission’s draft decision on the initial RAB value, all GPB assets in the initial RAB value will be valued in accordance with the relevant regulatory requirements, and as at the relevant balance dates, as set out in paragraph E2.2. There is no reason to single easements out for different treatment from other assets in the initial RAB value.
- E6.10 A number of submitters supported the Commission’s approach for new easements.⁶²¹ ENA did not agree with easements being included in the initial RAB value at nil where historical cost information was unavailable.⁶²² ENA considered that a more consistent approach would be to include easements at market value.⁶²³ Vector and Orion favoured valuing easements at market value and replacement cost, respectively.⁶²⁴ ENA and PwC submitted the following, with regard to the treatment of easements in the initial RAB value:⁶²⁵
- a. all easement rights in use and obtained prior to 1 April 2004 but obtained prior to 1 January 1993 Electricity Act amendments, should be included at cost and indexed by CPI from 1 April 2004;
 - b. all other easements obtained prior to 1 April 2004 and in use, should be included at market value; and
 - c. all easements obtained after 1 April 2004 should be included at cost and CPI indexed.
- E6.11 Similarly, Powerco submitted that “the opening 2004 ODV understates the value of easements as the methodology prevented any value to be assigned to an easement acquired prior to 1993 and permitted historical cost to be assigned at 2004 only where supporting evidence was available and where the cost had been capitalised”.⁶²⁶ Powerco further stated that “the proposed decision creates a strong

⁶²¹ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, p. 24, paragraphs 92-94; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 26, paragraph 82; Wellington Electricity Lines Limited, *Submission to the Commerce Commission on Draft Asset Value Input Methodology Decision (Electricity Distribution)*, 20 August 2010, p. 13, paragraph 2.2.6; GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 13, paragraphs 51.

⁶²² Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, p. 34, paragraph 153.

⁶²³ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, p. 28.

⁶²⁴ Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 78, paragraph 232; Orion, *Input Methodologies Draft Determinations Submission on Asset Valuation*, 19 August 2010, p. 24, paragraph 7.71.

⁶²⁵ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Initial Regulatory Asset Base*, 20 August 2010, p. 28; PwC, *Adjusting 2009 Information Disclosure Valuations for ENA*, 9 August 2010, p. 18; PwC, *Report to the ENA Revised ODV Handbook*, 9 August 2010, p. 7.

⁶²⁶ Powerco Limited, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009, p.22, paragraph 78, cited at Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 20 August 2010, p. 20, paragraph 73.

incentive to sell current easements valued at zero in the RAB, and then buy back replacement easements (the costs of which will be added to the RAB)".⁶²⁷ The Commission is not convinced that this risk is substantial in practice. Such transactions are not likely to be feasible on an arms length basis given the transaction costs involved. In developing the information disclosure requirements the Commission can also take into account the need for transparency of substantial asset sales and purchases. To the extent such an incentive exists this has been the case since 2004 under the 2004 ODV Handbook. Submitters have not presented any evidence that transactions of this nature have occurred during that period.

- E6.12 The proposal from ENA would mean any easements acquired after 1993 would effectively be included in the initial RAB value at market value. Easements acquired prior to 1993 would be included at historic cost (and CPI indexed from 2004). The Powerco proposal is that the pre-1993 easements that were included at nil value because there was no supporting evidence, should now be given some value. It is not clear from Powerco's submission what this value should be.
- E6.13 The ENA and Powerco proposals would recognise costs that businesses have not incurred in the past or where they have likely already earned a sufficient return on the investment. Further, the Powerco proposal would be difficult to implement in practice. Without any supporting evidence it would not be possible to give the pre-1993 assets an historic cost value and to give all easements a market value would be likely to substantially increase the RAB value, with no offsetting benefit in terms of the Part 4 Purpose.

E7 Capital Contributions and Vested Assets

Approach

- E7.1 The IM Determinations require all regulated suppliers to recognise capital contributions received from consumers by adding the net amount of the capital expenditure to the RAB value at the date the associated asset is commissioned. For this purpose, where the capital contribution does not reduce the cost of the asset under GAAP, the asset in question enters the RAB value at cost (measured in accordance with GAAP), reduced by the amount of the capital contribution received.
- E7.2 Regulated suppliers must include vested assets in the RAB value at the cost to the supplier, consistent with the cost based approach to additions, and with the net approach to capital contributions set out above. That is, the cost at which the asset enters the RAB value may not exceed the amount of consideration paid by the regulated supplier in respect of that asset. Where assets are vested at no cost to the regulated supplier, the RAB value of those assets should be nil, accordingly.

Reasons

- E7.3 The Commission agrees with submissions from ENA, Vector, and PwC, on behalf of 20 EDBs, that the approach to capital contributions should be to subtract them from the capital expenditure and add the net capital expenditure to the value of the RAB

⁶²⁷ Powerco Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 20 August 2010, p. 20, paragraph 73.

(net approach).⁶²⁸ This is a shift from existing information disclosure requirements, under which EDBs must add the gross amount of capital expenditure to the RAB value and treat capital contributions as income (the ‘income approach’).

E7.4 The Commission considers that adopting the ‘net approach’ avoids the year on year volatility in disclosed ROIs that occurs with treating capital contributions as income, which would affect assessing profitability for the purposes of information disclosure and resetting starting prices for DPPs. For CPPs, the net approach should reduce the effect of differences between forecast and actual capital contributions. Under the ‘net approach’ the effect of capital contributions are spread over the remaining life of the asset and should be NPV-equivalent to the ‘income approach’ over the life of the asset.

E7.5 The Commission considers that an equivalent approach should be adopted for vested assets, as the issues involved are similar. A number of submitters supported the Commission’s approach for vested assets in the roll forward.⁶²⁹

E8 Sale and Purchase of Assets

E8.1 Transactions for the sale and purchase of assets that are used to supply electricity distribution services, or gas pipeline services, may occur between regulated suppliers and other entities that are not regulated under Part 4, other entities that are related parties (including other parts of the EDB’s and GPB’s business),⁶³⁰ and other regulated suppliers.⁶³¹

E8.2 Such transactions should be treated consistent with GAAP, unless this is inconsistent with the Part 4 Purpose. The GAAP approach raises no concerns for arms’ length transactions between an EDB or GPB and an unregulated entity. Where an asset is purchased by a GPB or EDB from an entity not regulated under Part 4, the asset should be included in the RAB value at cost in the year of purchase, where cost is the purchase price of the asset. When an asset is sold, the RAB value should be

⁶²⁸ Electricity Networks Association *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, pp. 22-23, paragraphs 84-85; Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, pp. 83-85, paragraphs 263-273; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 25, paragraph 78.

⁶²⁹ For example, Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, p. 22; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 25, paragraph 75; Wellington Electricity Lines Limited, *Submission to the Commerce Commission on Draft Asset Value Input Methodology Decision (Electricity Distribution)*, 20 August 2010, p. 13, paragraph 2.2.6; GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 13, paragraphs 50; Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 78, paragraphs 229-230.

⁶³⁰ The IM Determination defines a related party to include any person that in accordance with GAAP is related to Transpower, or any part of Transpower that does not supply electricity transmission services.

⁶³¹ Other regulated suppliers may be other EDBs, GPBs, or suppliers of other services regulated under Part 4 such as electricity transmission services.

reduced by the carrying RAB value of that asset in the year in which the disposal occurs.

- E8.3 The IM Determinations implement the above approach, with the following exceptions:
- a. where an EDB or GPB buys an asset from another regulated supplier; and
 - b. where a regulated supplier buys an asset from a related party.

Acquisitions from another regulated supplier

Approach

- E8.4 Where an asset is purchased from another regulated supplier, the buyer must add the asset to its RAB value at the asset's equivalent value in the RAB value of the seller, i.e. at its most recent RAB value. This requirement overrides the requirements governing transactions between related parties, discussed in paragraphs E8.6 to E8.13 below.

Reasons

- E8.5 Where an EDB or GPB buys an asset from another regulated supplier, the asset base from which a return can be earned should not be affected by the sale price. Otherwise returns over the life of the asset could exceed the total cost of owning and operating the asset in the combined books of the vendor and purchaser. Such a result would not be consistent with limiting the ability of regulated suppliers to extract excessive profits. It could also provide suppliers with an incentive to trade assets unnecessarily in order to justify higher prices. In a workably competitive market, suppliers are not able to increase prices simply because assets have been traded between suppliers. Thus the Commission considers that the prescribed treatment under GAAP is not consistent with the Part 4 Purpose. Instead the carrying RAB value of the asset should be added to the RAB value of the purchaser and deducted from the vendor's RAB value.

Acquisitions from a related party (including other, unregulated, parts of the same business)

Approach

- E8.6 The IM Determinations require that, where a regulated supplier purchases an asset from a related party (provided the related party is not itself a regulated supplier in which case the requirement described in paragraph E8.4 applies), it must add the asset to its RAB value at:
- a. depreciated historical cost, provided documentation is available to support this; or
 - b. where sufficient records do not exist to establish this cost, its market value, as verified by an independent valuer.

- E8.7 For this purpose a related party includes both:

- a. business units of the same EDB and GPB, that supply services other than electricity distribution services and gas pipeline services; and
- b. a party that under GAAP is considered a related party (including any party that has conducted business either directly or indirectly with the supplier in the current financial year).

Reasons

- E8.8 Where a supplier of electricity distribution services or gas pipeline services purchases an asset from a related party—or sells an asset to a related party—the value at which the asset is transferred is open to manipulation. The presumption is that transactions with a related party are not arms’ length transactions. Without the discipline of an arms’ length negotiation the price paid may be greater (or less) than the asset’s market value. This could create a transfer of wealth between the EDB or GPB and consumers that would not occur in a workably competitive market.
- E8.9 To address this concern, the Commission considers that where a regulated supplier buys an asset from a related party, the asset’s RAB value should not be based on the purchase price, but instead on some objective, independent measure.
- E8.10 ENA submitted that requiring a market valuation in all cases would be too onerous. Instead, they suggested that if the EDB is the purchaser, the asset should be included in the RAB value at its market value, to be verified by an independent valuer, or where market value is deemed to be reasonably estimated by its depreciated historical cost, the asset may be included at depreciated historical cost.⁶³² PwC, on behalf of 20 EDBs, and Wellington Electricity supported this view.⁶³³
- E8.11 Vector agreed but suggested that if the value assigned to the assets transferred in a single transaction or series of related transactions within one regulatory year is below five percent of the RAB value for the year then an independent market valuation should not be required.⁶³⁴
- E8.12 The Commission acknowledges these concerns, and considers the proposal from ENA and PwC is a pragmatic solution. The IM Determinations adopt this approach.
- E8.13 The Commission also considered Vector’s proposal, but concluded that a threshold for this purpose is undesirable. It is difficult to find an objective basis for a threshold for related party transactions. A threshold could also distort decisions by regulated suppliers for example by encouraging regulated suppliers to structure deals such that individual transactions fall within the threshold. The particular threshold

⁶³² Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, pp. 21-22, paragraph 80.

⁶³³ PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 24, paragraph 71; Wellington Electricity Lines Limited, *Submission to the Commerce Commission on Draft Asset Value Input Methodology Decision (Electricity Distribution)*, 20 August 2010, p. 12, section 2.2.6.

⁶³⁴ Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 77, paragraph 224.

proposed by Vector, based on the individual supplier's total RAB value, would lead to very different outcomes across regulated suppliers, which does not appear warranted.

E9 Lost and Found Assets

Approach

- E9.1 A lost asset is an asset that was included in the opening RAB value of an EDB or GPB in a disclosure year, but is subsequently determined by the regulated supplier to never have been used to provide electricity distribution services or gas pipeline services. Regulated suppliers must remove lost assets from the RAB value in the disclosure year in which they are identified as lost, and must reduce the RAB value by the asset's opening RAB value in that disclosure year. After the initial RAB value has been established, lost assets that were in the initial RAB value will be permitted to remain in the RAB value.
- E9.2 For the purpose of the roll forward, a found asset is an asset that has not previously been included in the RAB value but is found by an EDB or GPB to have been used to provide regulated services in a previous disclosure year, and was commissioned after the disclosure year 2009. Regulated suppliers must add found assets to the RAB value in the year in which they are found, and must establish the RAB value of found assets at cost, consistent with GAAP, where sufficient records exist. Where sufficient records do not exist, the regulated supplier may assign the asset the same value as a similar asset in the RAB (where such an asset exists) that is:
- a. of a similar asset type and age; and
 - b. in the RAB value at the beginning of that disclosure year.
- E9.3 If no such similar asset exists, the regulated supplier must verify the asset's value based on an independent valuer's report confirming the asset's market value at the time the found asset is added to the RAB value.

Reasons

- E9.4 Once the initial RAB value is established, allowing regulated suppliers to add found assets that they were using to provide the regulated services as at the initial RAB date would have the effect of allowing revisions to the initial RAB value after it has been established. In particular, as discussed below (see paragraph E9.9), changes to the RAB value arising from adjustments for lost and found assets are not recognised as income. This could enable suppliers to seek to add found assets to the RAB value in the future in order to retrospectively increase the initial RAB value, without any offsetting adjustment reflected to income. This would reduce certainty for both suppliers and consumers under the Part 4 regime (see paragraph E2.8 above).
- E9.5 The permitted adjustments to 2009 disclosed values give regulated suppliers a comprehensive opportunity to correct for errors in the initial RAB value, including any assets found at that time.⁶³⁵ In light of this, the Commission considers there is

⁶³⁵ When establishing the initial RAB, regulated suppliers can find assets without restriction as part of the asset adjustment process. The Commission considers this should go some way to addressing concerns raised by submitters regarding the accuracy of existing regulatory valuations (for example see Vector Limited, *Submission on EDBs and GPBs (Input*

no justification for enabling suppliers to make further corrections in relation to 2009 disclosure values, once the initial RAB value has been established. This includes asset register corrections. Accordingly once the initial RAB value is established, corrections for lost and found assets are limited to:⁶³⁶

- a. in the case of lost assets, assets that are included in the RAB value after the disclosure year 2009; and
- b. in the case of found assets, assets that are commissioned after the 2009 disclosure year.

E9.6 Submitters supported the Commission's approach to lost and found assets in principle.⁶³⁷ ENA,⁶³⁸ PwC,⁶³⁹ Vector,⁶⁴⁰ and Wellington Electricity⁶⁴¹ submitted that, where records are not available to establish the cost of a found asset, 'found' assets should be able to be included at the same value as similar assets already in the RAB. This would be consistent with GAAP, and would avoid the compliance costs of using independent valuers to establish asset values.

E9.7 PwC, on behalf of 20 EDBs, proposed that this could be achieved by providing that where assets are found which are consistent with the asset categories included in the opening RAB, they are assigned the same value as a matching asset in the opening RAB, which has the same expected remaining asset life.⁶⁴²

E9.8 The Commission agrees, and has adopted PwC's proposals in the IM Determinations.

Methodology) Draft Determination and Reasons Paper, Attachment: Statement of Duncan Ian Head, 23 August 2010; Vector Limited, *Submission on EDBs and GPBs Revised Input Methodologies Draft Determination*, Attachment: *Supplementary Statement of Jeffrey Webster Wilson*, 19 November 2010.

⁶³⁶ The following hypothetical example illustrates the type of asset register corrections that will be permitted after the 2012 disclosure year. Assume an EDB constructs a new overhead line after 2009 (and assume for simplicity that the line is directly attributable to electricity distribution services). The original plan for the line provides for 50 poles. However only 49 poles are actually installed. The change in is not reflected in the asset register, so that when the new line is commissioned 49 poles are added to the RAB value. If the EDB discovers this error in a subsequent disclosure year the extra pole should be recognised as a lost asset and removed from the RAB value. Conversely if the final construction includes 51 poles, but only 50 are added to the RAB value when the line is commissioned (based on the original plan), then the EDB may correct for this error in a subsequent disclosure year under the provisions for found assets.

⁶³⁷ See, for example: Electricity Networks Association: *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward* 20 August 2010 (ENA, Submission 8 Valuation Roll Forward of the Regulatory Asset Base), p. 22, paragraph 82; GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 13, paragraph 49.

⁶³⁸ Electricity Networks Association: *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward* 20 August 2010 (ENA, Submission 8 Valuation Roll Forward of the Regulatory Asset Base), p. 22, paragraph 82.

⁶³⁹ PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, pp. 24–25, paragraph 74.

⁶⁴⁰ Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010 (Vector, Submission on EDBs and GPBs Reasons Paper, Asset Valuation), p. 77, paragraphs 227–228.

⁶⁴¹ Wellington Electricity Lines Limited, *Submission to the Commerce Commission on Draft Asset Value Input Methodology Decision (Electricity Distribution)*, 20 August 2010, p. 12, paragraph 2.2.6.

⁶⁴² PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, pp. 24–25, paragraph 74.

E9.9 Recognition of lost and found assets enables the correction of prior errors in the RAB value. This is distinct from revaluation gains and losses. Revaluations must be recognised as income as they reflect changes in the earning potential of an EDB's or GPB's assets. This is not the case when correcting for lost and found assets—EDBs and GPBs therefore do not need to recognise such corrections as revenue or an expense.

E10 Depreciation

E10.1 As discussed in Chapter 4, the IM Determinations provide that the standard depreciation method is straight-line depreciation using physical asset lives.⁶⁴³ Regulated suppliers under a DPP, and exempt EDBs operating under information disclosure only must use this approach for the purpose of information disclosure. Accordingly these suppliers must use the standard physical lives and deviate only in the circumstances outlined in this section.

E10.2 Regulated suppliers subject to default/customised price-quality regulation may apply to use an alternative depreciation approach under a CPP. An alternative approach might include:

- a. economic, rather than physical, asset lives; and/or
- b. accelerated depreciation for specific assets that are expected to become stranded; and/or
- c. an alternative method for calculating depreciation charges.

E10.3 Vector submitted that asset lives should be based on the economic life not the physical life of the asset.⁶⁴⁴ The Commission does not consider the use of economic asset lives as a standard for all regulated suppliers is justified in terms of the Part 4 Purpose. In particular reducing asset lives across the board would bring forward cash flows, and could be detrimental to current consumers. Instead the Commission considers the appropriateness of economic asset lives should be evaluated on a case by case basis in the context of CPP proposals. The IM Determinations allow EDBs and GPBs considerable flexibility to propose non-standard depreciation under a CPP, where they can demonstrate that this would better meet the Part 4 Purpose than the standard depreciation approach (based on physical asset lives).

E10.4 Depreciation, whether under the standard approach or an alternative approach, is subject to the overall constraint that total 'unallocated' depreciation (i.e. depreciation prior to the application of the cost allocation IM) over the lifetime of the asset, must not exceed the value at which the asset is first recognised in the RAB under Part 4 (after adjusting for the effects of revaluations). The value at which an asset is first

⁶⁴³ The adoption of straight-line depreciation as a standard approach was supported by submitters, for example Electricity Networks Association, *Submission 8 Valuation Input Methodology Roll Forward of the Regulatory Asset Base*, 20 August 2010, p. 11, paragraph 35; Wellington Electricity, Wellington Electricity Lines Limited, *Submission to the Commerce Commission on Draft Asset Value Input Methodology Decision (Electricity Distribution)*, 20 August 2010, pp. 12-13, paragraph 2.2.6; MEUG, *Submission on Input Methodologies for EDBs and GPBs Asset Values*, 16 August 2010, Appendix P1.

⁶⁴⁴ Vector Limited, *Submission in Response to the Commerce Commission's Draft Reasons Paper for Electricity Distribution Businesses and Gas Pipeline Businesses Asset Valuation*, 23 August 2010, pp. 78-82, paragraphs 236-253.

recognised in the RAB is its initial RAB value (for assets in the initial RAB value) or the asset's value of commissioned asset, or value of found asset, as determined pursuant to the IM Determination.

- E10.5 This section expands on the discussion in Chapter 4 by providing more detail on the requirements with respect to:
- a. standard physical asset lives, under the standard depreciation approach;
 - b. circumstances, under the standard depreciation approach, where physical asset lives may differ from standard physical asset lives; and
 - c. alternative depreciation.

Standard physical asset lives

Approach

- E10.6 The IM Determinations for EDBs, GDBs, and GTBs list standard physical asset lives for certain asset categories. Regulated suppliers must use the standard asset lives set out in Schedule A of the applicable Determination, to the extent they apply to the assets included in the RAB value, subject to permitted deviations (discussed in paragraphs E10.24 to E10.60 below).
- E10.7 For assets in the initial RAB value, the remaining life of the asset will be the asset's existing remaining life as at the balance date for each regulated supplier's 2009 disclosures. For assets acquired after that date, the remaining asset life shall be calculated from the commissioning date.

Reasons

- E10.8 Under a straight line depreciation approach, the depreciation charge in any year is calculated based on the asset's estimated life. Asset lives therefore have a significant effect on the time profile of depreciation charges. To the extent that depreciation is reflected in pricing, asset lives can determine the extent to which current or future consumers pay for assets.
- E10.9 Some regulatory regimes in overseas jurisdictions specify standard asset lives. Standard asset lives ensure that the depreciation charge in each period:
- a. is consistent from business to business for the same asset type; and
 - b. is appropriately allocated over the expected useful economic life of an asset.
- E10.10 A standard list of asset lives may also reduce regulatory costs and provide more certainty for EDBs, GPBs, and consumers.
- E10.11 The Commission considers under the standard depreciation approach, standard asset lives should be based on the physical lifetimes of the assets. In most cases physical lifetimes are likely to closely match economic lifetimes. This 'standard approach' to depreciation is:

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- a. generally consistent with economic depreciation at the level of the overall RAB; and
 - b. consistent with suppliers having appropriate investment incentives.

E10.12 The standard asset lives in the IM Determinations are based on existing lists:

- a. updated information on asset lives for gas pipeline businesses developed in 2007 as part of an updated ODV valuation during the Gas Authorisation;⁶⁴⁵ and
- b. asset lives contained in the 2004 ODV Handbook for electricity lines businesses.

Standard physical asset lives for EDBs

E10.13 PwC and SKM, on behalf of ENA, submitted that changes should be made to these existing asset lives for some asset categories, including:⁶⁴⁶

- a. extending the standard life for all XLPE and PVC cable installed from 1985 onwards from 45 years to 55 years. This is based on more information on the performance of this type of cable, including the fact that there is no evidence that a significant amount of XLPE cables are failing. (This extension would not apply to the earlier generations of this type of cable);
- b. extending the standard total life of zone substation buildings from 50 years to 70 years, consistent with existing evidence and, construction practices for modern equivalent assets; and
- c. introducing a standard asset life of 20 years for digital protection relays, compared to a 40 year life for analog/electromechanical equipment. This recognises the difference in life expectancy of digital and analog/electromechanical equipment. (The 2004 ODV Handbook specifies a standard asset life of 40 years for all protection relays).

E10.14 Vector and Wellington Electricity supported the above proposals.⁶⁴⁷

E10.15 The Commission considered that the proposed changes were reasonable. Accordingly, Schedule A of the IM Determination includes the above proposals.

E10.16 During submission on technical issues, ENA identified some inadvertent omissions which have also been corrected.⁶⁴⁸

⁶⁴⁵ Commerce Commission, *Authorisation for the Supply of Natural Gas Distribution Services by Powerco and Vector: Valuation of the Opening Regulatory Asset Base, Valuation Methodology*, 15 February 2007, Appendices B and C.

⁶⁴⁶ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: PricewaterhouseCoopers, SKM ODV Handbook Report: prepared for Electricity Networks Association*, 9 August 2010, p. 13.

⁶⁴⁷ Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, pp. 80-81, paragraph 245; Wellington Electricity Lines Limited, *Submission to the Commerce Commission on Draft Asset Value Input Methodology Decision (Electricity Distribution)*, 20 August 2010, p. 13, paragraph 2.2.6.

Standard physical asset lives for GPBs

- E10.17 GasNet submitted that the asset lives set out in the Draft Reasons Paper were reasonable with the exception of the 7 year life assigned to telecommunications systems. They submitted that the standard asset life for telemetry equipment should be extended from 7 years to 10 years.⁶⁴⁹
- E10.18 The change proposed by GasNet appears to be intended to bring the asset life into line with actual physical asset lives consistent with the proposed basis for standard asset lives. Therefore this change was accepted.
- E10.19 Vector submitted that the proposed 40 to 50 years plus asset lives are unrealistically high because they are not in accordance with inevitable developments in the energy market.⁶⁵⁰ Vector submitted a revised schedule for the standard assets for GDBs and GTBs, with the following proposed changes:
- a. HP pipelines – 80 to 70 years
 - b. HP pipeline valves – 80 to 35 years
 - c. IP pipeline valves – 70 to 35 years
 - d. MP pipeline valves – 60 to 35 years
 - e. Gas compressors – new 40 years
- E10.20 Vector's submission did not provide any asset specific justification for its proposed changes, other than the expectation that demand-side alternative energy will supplant grid delivered energy, and that the economic lives of transmission and distribution assets are therefore shorter than their standard physical lives.
- E10.21 The Commission acknowledges Vector's concern in this regard. However, it is difficult to establish with sufficient certainty when anticipated market changes will eventuate. The Commission considers that, as a standard approach, physical lives are the best, most objective proxy for economic lives. In most cases physical lifetimes will be in line with economic lifetimes. Under this approach depreciation across the RAB as a whole will generally be consistent with economic depreciation. Accordingly, the Commission did not accept Vector's proposed changes to the standard physical asset lives.
- E10.22 The Commission notes that where a regulated supplier considers that economic asset lives would better meet the Part 4 Purpose than straight-line depreciation using physical asset lives, and is able to provide evidence to substantiate this, the supplier may apply to implement an alternative depreciation approach under a CPP (see paragraphs E10.61 to E10.71 below).

⁶⁴⁸ Electricity Networks Association, *Submission on EDBs Revised Input Methodology Draft Determination, Attachment: Mark Ups*, 12 November 2010, p 105.

⁶⁴⁹ GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 14, paragraph 53.

⁶⁵⁰ Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 79, paragraph 238.

E10.23 Due to technical drafting suggestions from GasNet,⁶⁵¹ meters have been reclassified under ‘Stations’ and the range of operating pressures for intermediate pressure pipelines has been amended to be consistent with the latest NZS gas distribution standard. The reference to high pressure (HP) pipelines has not been deleted, as suggested by GasNet, as HP pipelines may still be relevant for other GPBs.

Circumstances in which physical asset lives may differ from standard physical asset lives

E10.24 The IM Determinations permit regulated suppliers to use physical asset lives that differ from the standard physical asset lives in Schedule A, in a number of circumstances, specifically:

- a. fixed life easements;
- b. dedicated assets;
- c. extended life assets and refurbished assets;
- d. reduced life assets;
- e. network spares;
- f. found assets;
- g. non-standard assets, i.e. assets not covered by the standard list of physical asset lives;
- h. assets in the initial RAB value;
- i. composite assets; and
- j. fully depreciated assets under a CPP.

E10.25 MEUG submitted that EDBs and GPBs contemplating a change from standard asset lives should consult with interested parties and register that process with the Commission. The Commission would then advise interested parties of the proposed change.⁶⁵²

E10.26 The Commission considers that MEUG’s proposal would not be practical and would impose unnecessary compliance costs. When a regulated supplier wishes to reduce an asset life, the IM Determinations require any reduction to be subject to an independent engineer’s report. The Commission considers this is sufficient protection for consumers, given that the effect of any change in asset lives will be NPV neutral. However, in developing information disclosure requirements to be set under Part 4, the Commission will consider requiring regulated suppliers to disclose information in relation to any change from standard asset lives, so that interested parties can assess the effect of any such change.

⁶⁵¹ GasNet Limited, *Submission on GPBs Revised Input Methodologies Draft Determination*, 12 November 2010, p 2.

⁶⁵² MEUG, *Submission on Input Methodologies for EDBs and GPBs asset values*, 16 August 2010, Appendix P1.

Fixed life easements

Approach

E10.27 Regulated suppliers must depreciate fixed life easements over the expected term of the easement.

Reasons

E10.28 Although easements usually do not suffer physical deterioration or obsolescence, it is possible for them to be established with a limited legal life or acquired by a supplier for a known, limited period of time. Where this is the case, regulated suppliers should be able to depreciate the easement over its lifetime.

Dedicated assets

Approach

E10.29 For dedicated assets,⁶⁵³ regulated suppliers can assign an asset life equal to the life of the supporting customer contract. This applies both to existing dedicated assets in the initial RAB value, and new dedicated assets commissioned in the future. Once a regulated supplier has set the asset life for an existing dedicated asset it may not subsequently change the asset life, unless there is a corresponding change in the contract, or a change in other relevant circumstances (i.e. it becomes apparent that the assets will continue to be used at the end of the contract).

Reasons

E10.30 A number of submitters proposed that assets constructed in order to meet a fixed-term contract with a specific customer ('dedicated assets') should be depreciated over the life of that contract, if there is limited scope for reuse.⁶⁵⁴ For example, Vector submitted that suppliers should be entitled to accelerate depreciation of dedicated assets consistent with the contractual arrangements with those customers, including the timeframe. This would ensure that regulatory arrangements match up with contractual arrangements with customers using dedicated assets, thus avoiding the potential for cross-subsidies.⁶⁵⁵

E10.31 The Commission considers this position to be consistent with the Part 4 Purpose. In a workably competitive market, if a supplier constructs a long-lived asset for a particular customer under a long-term contract, the supplier is likely to depreciate the asset over the term of the contract. This is because, once the contract expires, the supplier may have no realistic expectation of earning future revenue from that asset, and so must achieve a return of capital during the contract term.

E10.32 There is no reason to treat existing dedicated assets differently to dedicated assets that may be commissioned in the future, with respect to depreciation. This view was

⁶⁵³ The IM Determination defines a dedicated asset as "an asset operated for the benefit of a particular consumer pursuant to a fixed term agreement for the supply of electricity distribution services between an EDB and that consumer".

⁶⁵⁴ See for example, PricewaterhouseCoopers on behalf of 19 Electricity Distribution Businesses, *Submission to the Commerce Commission on the Input methodologies Discussion Paper*, 14 August 2009, p. 12.

⁶⁵⁵ Vector, *Post-workshop Submission, Submission on emerging views papers and electricity distribution services and gas pipeline service workshops*, 16 March, Appendix 2, p.11, Q. 30.

supported by submitters.⁶⁵⁶ Thus the IM Determinations apply the same treatment to dedicated assets in the initial RAB value, and those commissioned in the future.

Extended life assets and refurbished assets

Approach

E10.33 The IM Determinations enable regulated suppliers to extend asset lives beyond those provided in the list of standard physical asset lives, without the need for an independent engineer's report. This also applies to refurbished assets.

Reasons

E10.34 The Commission notes that, in principle, extending asset lives is an NPV-equivalent adjustment that would imply lower prices for consumers. The Commission has therefore determined that the IM Determinations should not constrain regulated suppliers from extending physical asset lives beyond those specified in the list of standard physical asset lives. In particular, a requirement for an independent engineer to sign-off an extension to an asset life would impose unnecessary compliance costs.

E10.35 Similarly, EDBs and GPBs may adopt an asset life for refurbished assets equal to or greater than the original remaining asset life.⁶⁵⁷

Reduced life assets

Approach

E10.36 EDBs and GPBs may apply asset lives less than the standard lives in Schedule A of the Determinations where considered appropriate. Any such reduction in asset lives must be supported by an independent engineer's report.⁶⁵⁸

Reasons

E10.37 Reduced asset lives may be appropriate for specific assets, for example on the basis of the asset's performance or particular environmental conditions. While changes in asset lives should be NPV neutral over time, reductions in asset lives can bring forward cash flows, and thus have the potential to increase prices to current consumers. The Commission therefore considers some independent verification is needed where regulated suppliers seek to reduce physical asset lives below those in the standard list. Reduced asset lives will need to be justified by an independent engineer's report assessing the expected physical lifetime of the assets concerned.

E10.38 MEUG recommend EDBs and GDBs contemplating a change from standard asset lives should be required to consult with interested parties and register that process with the Commission, which would advise interested parties of the proposed change.

⁶⁵⁶ PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 28, paragraphs 90–91; Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, p. 27, paragraph 106; GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 23 August 2010, pp. 14–15, paragraph 56.

⁶⁵⁷ GasNet supports this approach, see GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 14–15, paragraphs 53–56.

⁶⁵⁸ GasNet supports this approach, see GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 14–15, paragraphs 53–56.

The Commission considers this proposal would impose unnecessary compliance costs. When a regulated supplier wishes to reduce an asset life, protection for consumers is provided by the requirement for an independent engineer's report, discussed above. The Commission is required to set ID requirements for regulated suppliers under Part 4, and anticipates that this will include information in relation to asset lives where these differ from the prescribed list of standard physical asset lives.

Network spares

Approach

E10.39 The IM Determinations require regulated suppliers to determine when to commence depreciating network spares consistent with GAAP.

Reasons

E10.40 GAAP requires depreciation of an asset to begin when it is available for use, i.e. "when it is in a location and condition necessary for it to be capable of operating in a manner intended by management".⁶⁵⁹

E10.41 Submissions from ENA, PwC on behalf of 20 EDBs, and GasNet interpret GAAP as requiring assets, including network spares, to be depreciated from when they are physically put into service.⁶⁶⁰ PwC stated that spares do not start to use their service potential until they have been installed on the network and commissioned. GasNet submitted that depreciating spares from the date they are delivered to store is inconsistent with GAAP – spares should be depreciated from the time their remaining service potential reduces, which for most assets is not until they are put in service.

E10.42 As submitters on this point have noted, it is essential that suppliers have ready access to spares to allow timely maintenance and repairs in order to meet quality of service expectations. Taking this into account, the Commission considers that suppliers should be permitted to determine when to start depreciating spares, provided this is consistent with GAAP.

Found assets

Approach

E10.43 Where a regulated supplier adds a found asset to the RAB value, and where the RAB already contains a similar asset, the IM Determinations provide that the asset life of the found asset should be the asset life applying to the similar asset. For this purpose 'similar' means similar in terms of asset type and age. Where no such similar asset exists, the regulated supplier must assign an asset in line with remaining provisions for physical asset lives.

⁶⁵⁹ NZ IAS 16, paragraph 55.

⁶⁶⁰ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, p. 26, paragraph 100-101; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010 p. 28, paragraph 89; GasNet Limited, *Input Methodologies (Gas Pipeline Services) Draft Reasons Paper and Draft Determinations*, 9 August 2010, pp. 14, paragraph 54.

Reasons

E10.44 Establishing asset lives for found assets with reference to a similar asset already in the RAB, where such an asset exists, is consistent with provisions for establishing the value of found assets (see paragraph E9.2), and with the treatment of non-standard assets (see paragraphs E10.45 to E10.49 below). This treatment should ensure similar assets are treated on the same basis—thereby assisting interested parties in monitoring asset related information disclosures—and should reduce compliance costs.

Non-standard assets (not covered by the standard list of physical asset lives)

Approach

E10.45 Where assets are commissioned in the future that are not covered by the list of standard physical asset lives, regulated suppliers must set asset lives as follows:

- a. where an asset of the same type is already in the RAB, use the same asset life as assigned to the existing asset; and
- b. otherwise set asset lives for the assets, provided they are supported by an independent engineer's report.

Reasons

E10.46 Where an asset is not covered by the standard list of physical asset lives, a regulated supplier must establish the asset's life. Some independent check or verification of such asset lives is required, to ensure they reflect the asset's expected physical lifetime. ENA and Vector submitted that requiring lives for non-standard assets to be established by an independent engineer in all cases would impose unnecessary compliance costs.⁶⁶¹ Vector proposed that an independent engineer's report should only be required where there are no comparable assets in the RAB, otherwise the EDB can establish a life (which is not to exceed the asset life for comparable assets).

E10.47 Similarly, PwC, on behalf of 20 EDBs proposed that an independent engineer's report should only be required where an asset of the same type is not already included in the asset register or where the asset life proposed differs from the life assigned to a similar asset which already exists in the asset register.⁶⁶² As well as managing compliance costs this would ensure similar assets are treated on the same basis, which should assist interested parties in monitoring asset related information disclosures.

E10.48 Where an asset of the same type is already in the RAB, it makes sense to use the same asset life, unless there are good reasons to use a different life (such as environmental or usage differences). PwC's proposal is sensible and will encourage consistency between assets in the RAB. The Commission has therefore incorporated this treatment in the IM Determinations.

⁶⁶¹ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, p. 26, paragraph 102; Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 81, paragraphs 246-248.

⁶⁶² PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 27, paragraph 85.

E10.49 GasNet noted that the list of standard physical asset lives in Schedule A of the IM Determination does not include asset lives for non-system fixed assets, and submitted that these should be determined in accordance with GAAP as this is cost effective.⁶⁶³ The provisions discussed above apply to all asset that are not covered in Schedule A, including non-system fixed assets. In the case of new non-system fixed assets, regulated suppliers should already have similar assets in their RAB, and can establish asset lives on that basis.

Assets in the initial RAB value

Approach

E10.50 For assets in the initial RAB value, the physical asset life will be the asset's existing remaining life as at the balance date for each EDB's or GPB's 2009 disclosures.

Reasons

E10.51 The compliance costs of changing the asset lives of existing assets to align with the standard physical asset lives could be substantial, and in the Commission's view is not warranted. For EDBs, lives of existing assets should already be largely consistent with the standard physical asset lives in the IM Determination, given that these are based on the 2004 ODV Handbook. Accordingly, regulated suppliers should retain existing asset lives for all assets in the initial RAB value (with the exception of dedicated assets, as discussed in paragraphs E10.29 to E10.32).

Composite assets

Approach

E10.52 Composite assets are assets comprising a number of components with differing lives. The IM Determinations require that the total asset life for a composite asset must be calculated as a weighted average of the lives of those components.

Reasons

E10.53 This treatment is consistent with existing requirements, where these exist (for example the 2004 ODV Handbook). No parties have raised concerns with this proposed approach in submissions.

Fully depreciated assets under a CPP

Approach

E10.54 For the purposes of CPP proposals, no system fixed assets should be forecast to be written off during a regulatory period. All such assets in service at the start of a CPP regulatory period are deemed to have a physical asset life equal to the duration of the CPP period.

E10.55 Under information disclosure, fully depreciated assets should be written off at the time they become fully depreciated.

Reasons

E10.56 In some cases assets may be depreciated too quickly, to the extent that they are fully depreciated before the end of their economic lives. As a result the value to the

⁶⁶³ GasNet Limited, *Input Methodologies (Gas Pipeline Services) Draft Reasons Paper and Draft Determinations*, 9 August 2010, pp. 14-15, paragraphs 53

supplier of additional service would not be recognised, and the supplier may even have little incentive to keep the assets in service rather than replacing them.

- E10.57 System fixed assets tend to be long-lived and so, if they are in service at the beginning of a regulatory period, they are likely to continue in use throughout the period. The Commission therefore considers that, where an asset is due to become fully depreciated during a regulatory period, the owner should continue to be entitled to earn a return on that asset throughout the regulatory period, to recognise the value it provides.
- E10.58 A number of submitters agreed with the Commission's proposed approach in principle, and supported a remaining useful life for fully depreciated assets of five years, in order to be consistent with the regulatory period.⁶⁶⁴ MEUG submitted that this was an unjustified windfall gain to EDBs and GPBs.⁶⁶⁵
- E10.59 The Commission considers that the proposed treatment of fully depreciated assets will not provide any windfall gain or loss to supplier. In particular this approach is subject to a general constraint that total depreciation over the life of an asset may not exceed the total value of that asset, including revaluations, over its lifetime.
- E10.60 The proposed treatment should simplify forecasting for CPP applications, by requiring suppliers to spread remaining depreciation over the term of a CPP, in preparing forecasts for a CPP proposal.

Alternative depreciation

Approach

- E10.61 The IM Determinations allow for alternative depreciation approaches under a CPP. Regulated suppliers may apply to use an alternative depreciation approach under a CPP where they consider the proposed approach better meets the Part 4 Purpose than the standard depreciation method under the IM for the valuation of assets. For this purpose, alternative depreciation might involve the use of a different depreciation method from straight-line depreciation and/or the use of economic asset lives rather than physical asset lives.
- E10.62 The Commission will review each proposal and will only apply an alternative to the standard approach where it is satisfied that the result of applying the alternative approach would better meet the Part 4 Purpose.

⁶⁶⁴ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, p. 29, paragraphs 116-117; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 30, paragraph 98; Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 83, paragraph 262; GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 16, paragraph 61.

⁶⁶⁵ Major Electricity Users' Group, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses) Determinations and Draft Reasons Papers*, 16 August 2010, p. 3.

Reasons

- E10.63 The standard form of depreciation, CPI-indexed straight-line depreciation, will—in steady-state conditions (e.g. when investment is not increasing)—equate to economic depreciation at the level of the overall RAB even if the individual assets that go to make up the RAB value have very different economic depreciation profiles.
- E10.64 While there are a number of reasons for favouring CPI-indexed straight-line depreciation over alternative forms, the Commission agreed with submissions that there are likely to be certain situations in which an element of flexibility may be appropriate. The Commission considers that as part of the customised price quality path proposal process, EDBs and GPBs should be permitted some flexibility in deciding which alternative approach would better meet their particular circumstances.
- E10.65 The Draft Determinations allowed for alternative depreciation approaches under a CPP, but only where:
- a. for any individual asset, in any financial year, the proposed non-standard depreciation methodology would result in an increase or decrease in the depreciation charge (relative to straight line depreciation) of between 20 and 50 percent;
 - b. the resulting increase or decrease in the aggregate depreciation charge over the term of the CPP is no more than 5 percent.
- E10.66 ENA, Vector, and Wellington Electricity submitted that in proposing a CPP, suppliers should have discretion to choose their own depreciation charge irrespective of whether the changes they wanted fell within a certain limit.⁶⁶⁶ These submitters argued that the Commission should review all proposed changes on a case by case basis, in the context of better meeting the Part 4 Purpose. The Commission agrees with submitters that alternative depreciation under a CPP should not be subject to specific limits or thresholds. However, the Commission considers that regulated suppliers must provide evidence to show that applying any alternative depreciation approach would better promote the purpose of Part 4 than applying standard straight-line depreciation based on physical asset lives.
- E10.67 A number of submitters have argued that alternative depreciation should not be limited to CPPs, but should be available under ID requirements for all EDBs, and thus be incorporated into the DPP.⁶⁶⁷ The Commission has given these submissions

⁶⁶⁶ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, pp. 27-28, paragraphs 107-112; Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper, Customised Price-Quality Paths*, 25 August 2010, pp. 35-37, paragraphs 135-145; Wellington Electricity Lines Limited, *Submission to the Commerce Commission on Draft Asset Value Input Methodology Decision (Electricity Distribution)*, 20 August 2010, p. 13, paragraph 2.2.6; Powerco, *Submission 3 in Response to Draft Input Methodology Decisions and Determinations Asset Valuation*, 20 August 2010, p. 32, paragraph 133.

⁶⁶⁷ For example, see: Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, p. 28, paragraphs 108-109; GasNet Limited, *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper*, 9 August 2010, p. 15, paragraphs 57-59; Powerco Limited, *Submission on the*

careful consideration, but has concluded that it is not possible to incorporate alternative depreciation approaches into the DPP, as submitters propose.

- E10.68 By their very nature, DPPs cannot be based on forward looking estimates of each supplier's upcoming depreciation charges. This would require a detailed review of each supplier's capital expenditure proposals, because depreciation allowances are calculated on the basis of existing and forecast investments. Detailed capital expenditure reviews are a costly and time consuming process, which would appear to be contrary to the 'one-size-fits-all', low cost approach that is to be used to set DPPs.
- E10.69 The Commission therefore sees no benefit in allowing alternative depreciation methods under ID requirements for all EDBs. This would have no direct effect on cash flows for regulated suppliers operating under a DPP.
- E10.70 The Commission acknowledges submitters' concerns that some flexibility is required for suppliers under a DPP to accommodate matters such as unanticipated changes in demand, or environmental conditions. Consequently, the IM Determination permits regulated suppliers to retain assets that are no longer required ('stranded assets') in the RAB value until they are fully depreciated (see section E11 below) and, as discussed above, it also allows regulated suppliers considerable flexibility to apply physical asset lives that differ from the standard physical asset lives.
- E10.71 Certain consumer owned suppliers are not subject to default/customised price-quality regulation and are consequently said to be 'exempt'. These suppliers are instead only subject to information disclosure regulation. Because the consumers own a large proportion of the business, the Commission considers that many of the issues relating to economic depreciation are not relevant to these suppliers. For example, both consumers and owners bear the risk of asset stranding. In addition, since these suppliers are only subject to information disclosure regulation, they are not constrained to price on the basis of the methodology the Commission determines under Part 4. Therefore the IM does not contain any scope for 'non-standard' approaches to depreciation for exempt EDBs. This is consistent with the purpose of ID regulation, since interested persons will still be able to assess whether the purpose of Part 4 is being met using this methodology.

E11 Stranded Assets

Approach

- E11.1 For various reasons, the use of an asset, or demand for the service that asset provides may fall away unexpectedly during the asset's lifetime. Where this happens, the asset becomes 'stranded'.

Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, 20 August 2010, p. 32, paragraph 133; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, p. 28, paragraph 92; Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, pp. 82–83; Wellington Electricity Lines Limited, *Submission to the Commerce Commission on Draft Asset Value Input Methodology Decision (Electricity Distribution)*, 20 August 2010, p. 13.

- E11.2 The IM Determinations do not explicitly address stranded assets. As a result, where demand for the asset falls away, regulated suppliers may retain the asset in the RAB value for the purpose of ID, and continue to depreciate the asset over its remaining asset life. Where a regulated supplier anticipates that this will occur in the future:
- a. under the standard depreciation approach the supplier may reduce the physical asset life, where the asset meets the criteria for a ‘reduced life asset’, and the proposed reduced life is supported by an independent engineer’s report (see paragraphs E10.36 to E10.38 above); or
 - b. the supplier may apply to implement accelerated depreciation through a CPP (see paragraphs E10.61 to E10.71 above). Such applications would be covered under the alternative depreciation mechanism discussed above. This option is available if the regulated supplier considers accelerated depreciation is more consistent with the Part 4 Purpose than the alternative option of retaining the asset in the RAB value for ID purposes, and seeking to recover the residual value of the asset under a DPP.⁶⁶⁸

Reasons

- E11.3 In order for firms to invest in long-lived, specialised assets, they must have an expectation that they will be able to earn a normal return on, and a return of, their investment over the asset’s lifetime.
- E11.4 In workably competitive markets, firms account for the risk of stranding *ex ante* through their expected return on the project. In a regulatory context, where demand for services supplied by an asset falls away for reasons beyond the supplier’s control, ensuring the supplier is compensated for any losses it incurs protects incentives for new investment, consistent with s 52A(1)(a). This is particularly important where the assets involved are large, and long-lived.
- E11.5 In formulating its draft decisions, the Commission considered several options for stranded assets, for suppliers subject to default-customised price-quality regulation:
- a. including an *ex ante* allowance for stranding, possibly through the WACC, and requiring stranded assets to be written off at the time they are stranded;
 - b. requiring assets that are no longer required to be written off in the year in which they are stranded, and providing for accelerated depreciation of stranded assets through the CPP mechanism only;
 - c. providing that stranded assets should be depreciated in the year in which they become stranded, under a DPP; or
 - d. allowing EDBs and GPBs under a DPP to retain such assets in the RAB value until they are fully depreciated.
- E11.6 The first option, accounting for stranding risk through an allowance in the WACC, is theoretically consistent with outcomes in workably competitive markets (see

⁶⁶⁸ The residual asset value is equivalent to the remaining level of capital employed in the assets, and therefore reflects how much of the original financial capital has already been recovered through past revenues.

- paragraph E11.4). However, the Commission has rejected this option as it is not practical to implement. In particular it would be difficult to assess an appropriate allowance, which would probably differ between individual suppliers.
- E11.7 Similarly, the Commission has concluded that the second and third options are not practical. Requiring suppliers to only recover the residual value of a stranded asset through a CPP would impose a costly and involved process on regulated suppliers. This could discourage some providers, who would then be potentially unable to recover the value of their stranded assets. This appears to be unnecessarily burdensome.
- E11.8 On the other hand, requiring suppliers to fully depreciate assets in a DPP in the year in which it becomes apparent that demand for services supplied by that asset will fall away, raises a number of other problems. Depending on the timing of the stranding, this could have no effect on the suppliers' cash flows (in which case they are in practice unable to recover the value of the asset). Further, under this approach asset stranding would cause fluctuations in the ROI in the year of stranding, and the following year. This could complicate the process of starting price adjustments for future regulatory periods.
- E11.9 In practice, the option of allowing EDBs and GPBs to retain stranded assets in the RAB value until they are fully depreciated is the only way to ensure suppliers can receive a return on capital invested. Further, this option avoids the potential distorting effect accelerated depreciation could have on the ROI and starting price adjustments, under a DPP.
- E11.10 A number of submitters supported the Commission's approach of retaining stranded assets in the RAB value, and depreciating them across their remaining asset life.⁶⁶⁹ ENA noted this is a pragmatic approach, and consistent with paragraph (a) of the purpose statement. Unison submitted that, as a matter of regulatory pragmatism, the Commission's approach may be preferred (including with respect to s 52A(1)(a)-(d) in isolation), but it cannot be justified as being consistent with workably competitive outcomes.⁶⁷⁰
- E11.11 MEUG in its submission opposed this treatment, stating that assets that are stranded should be for the account of shareholders.⁶⁷¹ MDL noted that it would appear to be 'overkill' to require suppliers to apply for a CPP to accelerate depreciation on stranded assets. MDL considered that "withholding of accelerated depreciation in

⁶⁶⁹ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, p. 29, paragraphs 114-115; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, pp. 29, paragraph 97; Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 83, paragraph 260; GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 15, paragraph 60.

⁶⁷⁰ Unison Networks Limited, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 20 August 2010, pp. 6-7.

⁶⁷¹ Major Electricity Users' Group, *Submission on EDBs (Input Methodology) Draft Determination and Reasons Paper, Submission on Input Methodologies for EDBs and GDBs asset values*, 16 August 2010, p. 2.

certain circumstances, particularly where capital is required to fund replacement assets, may be considered contrary to incentivising investment”.⁶⁷²

- E11.12 As noted in paragraph E11.2, under the standard depreciation methodology regulated suppliers may reduce an asset’s life, provided this is supported by an independent engineer. This option will enable suppliers to bring forward depreciation on assets in some cases. Where the asset does not meet the criteria for a reduced asset life under the standard depreciation approach, the supplier may apply for a CPP.
- E11.13 Providing that stranded assets are “for the account of shareholders”, as proposed by MEUG, requires that assets must be written off at the time they are stranded. In this case, shareholders would expect a margin, or allowance, in their expected return to account for the risk of stranding. Otherwise they will be unwilling to invest. This is the first of the above options. As already discussed, the Commission considers this approach is not feasible to implement.
- E11.14 Allowing EDBs and GPBs to retain assets in the RAB value until they are fully depreciated, even where demand falls off before this happens, is the pragmatic solution. However, EDBs and GPBs should not be eligible for compensation for asset stranding in this way just because the loss was due to an event that appeared to be beyond the EDB’s or GPB’s control.
- E11.15 In workably competitive markets, EDBs and GPBs would have incentives to seek to continue to use, and earn a return on all their assets. They would therefore strive to find an alternative use for stranded assets, rather than writing them off. Under Part 4 it is desirable that EDBs and GPBs have incentives to take such action to avoid assets becoming stranded. In particular, this would be consistent with s 52A(1)(b) of the Act.⁶⁷³
- E11.16 The Commission is required to set information disclosure requirements for EDBs and GPBs under Part 4. Although the Commission has yet to set these requirements, and will consult on the detailed requirements as part of that process, the possible types of information that may be required where an asset is stranded, or is likely to become stranded includes information on whether EDBs and GPBs have taken action to reduce the possibility of asset stranding, or to find an alternative use for a stranded asset.

E12 The Consumer Price Index

Approach

- E12.1 The IM Determinations require all regulated suppliers, and where applicable the Commission, to use a value of the Consumer Price Index (CPI) for the following purposes:
- a. indexing existing regulatory valuations for the purpose of establishing the initial RAB value, in the case of:

⁶⁷² Maui Development Ltd., *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper*, August 2010, p. 9.

⁶⁷³ Commerce Commission, *Input Methodologies Discussion Paper*, 19 June 2009, pp. 176–177, paragraphs 6.199 to 6.203.

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- i. assets covered by the Gas Authorisation
 - ii. Vector's NGC Distribution and NGC Transmission assets
 - b. calculating annual revaluations for the purpose of rolling forward the RAB value under information disclosure
 - c. forecasting the RAB value when applying for a CPP; and
 - d. calculating a CPP price path.
- E12.2 The Commission's approach is that:
- a. where an actual CPI value is required it will be the CPI stipulated in the 'All Groups Index SE9A' as published by Statistics New Zealand
 - b. where a forecast value of the CPI is required, if the Reserve Bank of New Zealand (Reserve Bank) has forecast the change in the headline CPI for the relevant quarter in its most recently available Monetary Policy Statement, it will be that value; and
 - c. if the Reserve Bank has not forecast the CPI for that quarter, the a projection based on the arithmetic average in the last four quarters of the most recent Reserve Bank forecast should be used.
- E12.3 Both the Commission and the supplier must apply these values in calculating building blocks allowable revenue and the price path.
- E12.4 An adjustment is required to CPI values for quarters prior to December 2010 to take account of the effect of the Government's increase to the Goods and Services Tax (GST) from 12.5% to 15%, which takes effect from 1 October 2010, on the CPI. The Commission's approach is to multiply CPI values prior to December 2010 by 1.02. This is based on the estimate published by the Reserve Bank.⁶⁷⁴ The adjustment mechanism in the IM Determinations could also apply to any future changes to GST.

Reasons

- E12.5 In selecting a source for the forecast CPI, the Commission sought a well-established, independent forecast series that is published in a timely manner. The Commission considers that the Reserve Bank's CPI forecast meets these criteria.
- E12.6 The default price-quality paths recognise that regulated suppliers will face inflationary and other increasing cost pressures in respect of their incremental capital and operating expenditures during a regulatory period. In relation to asset valuation, CPI-indexed straight-line depreciation represents a simple and transparent method of calculating depreciation in a way that is generally consistent with economic depreciation.

⁶⁷⁴ Reserve Bank of New Zealand, Monetary Policy Statement, June 2010, p. 22, available from: <http://www.rbnz.govt.nz/monpol/statements/jun10.pdf>

- E12.7 Powerco⁶⁷⁵ submitted that the proposed GST adjustment should be removed from the CPI index to be used for maximum allowable revenue and asset revaluations as it is inconsistent with principled regulatory decision making and the Commission's objectives for indexation. Similarly ENA, Vector, and PwC did not support the GST adjustment to the CPI.⁶⁷⁶ Unison submitted that the proposed adjustments to CPI would be contrary to the real financial maintenance concept. Post 1 October 2010, the real value of an EDB's assets would be diminished by the full increase in CPI (including the effect of GST). Therefore, in order to maintain the real value of the RAB, it is necessary to index the RAB by the full CPI increase.⁶⁷⁷
- E12.8 In the case of the GST increase in October 2010, consumers pay the increased tax but the effect on suppliers will be neutral. The cost base of each supplier will be unaffected by the GST increase as suppliers claim back their direct GST costs.⁶⁷⁸ The corresponding increase in the CPI therefore does not represent an increase in costs to suppliers. However, if the CPI increase was fully recognised, suppliers' revenues would increase, in particular through the effect on the value of the RAB, but also more directly in terms of higher revenues through the price path indexation. This would be a net gain to suppliers. The Commission therefore considers it appropriate to remove the effect of the GST increase from the CPI series used for revaluation and price path setting purposes.⁶⁷⁹ The Commission considers its approach will leave the real value of the suppliers' investment unaffected.
- E12.9 Unison⁶⁸⁰ also submitted that the Commission's proposal to adjust the CPI in order to remove the effects of GST would be unlawful under the proposed criteria for DPP re-openers. The Commission notes that a DPP maybe amended under s 54K(3), once the IMs have been set.
- E12.10 In relation to the method for calculating the CPI where a Reserve Bank forecast is not provided, the Commission considers that extrapolating the forecast as provided for in the IM Determinations is appropriate because:
- a. economic forecasts are uncertain; this uncertainty can be expected to increase the further ahead into the future these are made. For CPI, the CPP requires

⁶⁷⁵ Powerco, *Submission 4 in Response to Draft Input Methodology Decisions and Determination Customised Price Quality Paths*, 23 August 2010, p. 8, paragraph 24.

⁶⁷⁶ Electricity Networks Association, *Submission 9 Customised Price Quality Path Input Methodology*, 23 August 2010, pp. 31-32, paragraphs 117-120. Vector, *Submission in Response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Customised Price-Quality Paths*, 25 August 2010, p. 28, paragraph 107; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 19 August 2010, pp. 22-23, paragraphs 65-68.

⁶⁷⁷ Unison, *Input Methodologies Electricity Distribution Services-Customised Price Quality Path Requirements*, 23 August 2010, p. 3, paragraphs 12-14.

⁶⁷⁸ With regard to indirect costs, the RBNZ Monetary Policy Statement noted "Budget 2010 included reductions to personal tax rates that more than offset the effects of the increase in GST on real incomes. The GST increase is therefore assumed to have no effect on wage bargaining. Increases in other indirect taxes are assumed to have only a limited impact on inflationary expectations."

⁶⁷⁹ The Reserve Bank of New Zealand estimates that the increase in GST translates to a 2.02 percent increase in CPI inflation. For the Commission's purposes this figure has been rounded to 2 percent.

⁶⁸⁰ Unison, *Input Methodologies Electricity Distribution Services-Customised Price Quality Path Requirements*, 23 August 2010, p. 3, paragraphs 12-14.

forecasts that are further into the future than those available from the Reserve Bank; and

- b. the Commission considers it reasonable to assume that, in the absence of other information, the information from the most recent 12 month period is likely to be most representative of inflation in the future.

E12.11 Therefore, in the absence of an economic model that is consistent with the Reserve Bank's forecasts and that could be used to develop longer term inflation forecasts, the Commission considers that a projection based on the most recent 12 month period (such as the last four quarters of the latest available Reserve Bank forecast) is a reasonable assumption for CPI inflation in the following years.

E13 Application of the IM for the Valuation of Assets

E13.1 This section discusses

- a. application of the IM for the valuation of assets to information disclosure regulation; and
- b. application of the IM for the valuation of assets to default/customised price-quality regulation.

Application of the IM for the valuation of assets to information disclosure

Role of the RAB value under information disclosure

E13.2 Pursuant to s 52S, the Commission must apply the asset valuation IM when setting information disclosure requirements under subpart 4 of Part 4. Both exempt and non-exempt EDBs and GPBs will be required to disclose information in accordance with these requirements.

E13.3 The purpose of information disclosure is to ensure sufficient information is readily available to interested persons to assess whether the purpose of Part 4 is being met (s 53A). To this end, the Commission anticipates that, among other things, it will require regulated suppliers to disclose their return on investment (ROI). As is discussed in Chapter 2, the ROI is expected to be a key component of information disclosure regulation, as it will inform interested parties' assessment, and the Commission's analysis, of whether regulated suppliers are limited in their ability to earn excessive profits (s 52A(1)(d)).

E13.4 On an annual basis, and in simplified form, a regulated supplier's ROI can be calculated as follows:

$$\text{ROI} = \frac{\text{Revenue} - \text{Depreciation} - \text{Opex} - \text{Tax} + \text{Revaluations}}{\text{Regulatory Investment Value}}$$

E13.5 EDBs and GDBs must use a deferred tax approach for the purpose of Part 4 (see Chapter 5). Accordingly, for those suppliers, the denominator of the above formula must be adjusted for the regulatory deferred tax balance.

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- E13.6 The Commission and other interested parties may compare ROIs calculated in this way to the WACC established for regulated suppliers under Part 4. Such comparisons will enable interested parties to assess regulated suppliers' profitability over time.
- E13.7 The IM for the valuation of assets is a key input into the calculation of the ROI measure, as it determines:
- a. the level of depreciation charges;
 - b. the value of revaluations; and
 - c. the total value of the Regulatory Investment Value (the denominator in the above equation which, among other things, comprises the RAB value plus the value of the regulatory deferred tax balance, where applicable).
- E13.8 In addition to the ROI measure, the Commission anticipates that it will require regulated suppliers to disclose additional information on asset valuation. The list below gives an indication of the type of information regulated suppliers may be required to disclose:
- a. information on financing costs for works under construction;
 - b. AMPs;
 - c. information in relation to asset lives. Where a regulated supplier, under a DPP, uses asset lives that differ from the prescribed list of standard physical asset lives, information to show that the asset lives meet the requirements of the IM Determinations have been met. This may include independent engineers' reports where applicable; and
 - d. information in relation to stranded assets retained in the RAB value.

Asset allocations in establishing and rolling forward the RAB value

- E13.9 As discussed elsewhere in this paper, the IM Determinations require EDBs and GPBs to establish their initial RAB values from existing regulatory valuations, namely:
- a. the regulatory asset values disclosed in 2009 in accordance with applicable information disclosure requirements; or
 - b. in the case of assets that are subject to the Gas Authorisation, the RAB values determined under the Gas Authorisation for the financial year ending in 2005, updated to the financial year ending in 2009 for capital expenditure, depreciation and CPI-indexation

with some modifications permitted, as discussed in Section E2.

- E13.10 In order to ensure that initial RAB values are allocated consistent with the requirements of Part 4, the IM determination requires regulated suppliers to

‘unwind’ any previous asset allocation and apply the cost allocation IM as follows. Regulated suppliers must:

- a. establish unallocated initial RAB values for each asset, using the asset values in the applicable existing regulatory valuations, but valued as if no allocation of asset value relevant to regulatory disclosures had been undertaken;
- b. apply the cost allocation IM to the unallocated initial RAB values, to establish the initial RAB value for each asset.

E13.11 The roll forward of the asset values in the RAB for a disclosure year must reflect the changes occurring in that year in the allocation of assets between electricity distribution services and gas pipeline services, and between all types of regulated services and unregulated services (in aggregate) that an EDB or GPB supplies. Submitters on this topic agreed with this principle, but emphasised the risk that it could add additional complexity, hinder the ability of interested parties to monitor annual disclosures, and increase compliance costs.⁶⁸¹

E13.12 The IM determination requires regulated suppliers to record the total (i.e. ‘unallocated’) value of an asset in the RAB and roll it forward (for depreciation, revaluations, additions etc) on an unallocated basis. The cost allocation methodology described in Chapter 3 and Appendix B is applied to this asset value whenever it is necessary to determine a specifically attributable (i.e. ‘allocated’) portion of the asset value for regulated activities.

E13.13 The ‘allocated’ RAB value is used to calculate depreciation and revaluations in respect of that asset for that year. As the opening RAB value for any asset in a disclosure year is simply the closing RAB value for the preceding disclosure year, the cost allocation methodology need only be applied once in any disclosure year (to the unallocated closing RAB value) in order to produce an allocated closing RAB value.

E13.14 This process should ensure that as the RAB value is rolled forward it continues to reflect an up-to-date allocation of asset values. It is simpler and easier to implement than what was outlined in the Draft Determinations, and the Commission considers it is likely to reflect the type of allocation process adopted by suppliers in practice.

Application of the IM for the valuation of assets to default/customised price-quality regulation

E13.15 As is noted in Chapter 2, a comparison of the WACC and the disclosed ROIs may inform starting price adjustments for DPPs, as under s 53P(3)(b) starting price adjustments can be based on current and projected profitability. Therefore, given its application in determining disclosed ROIs, the IM for the valuation of assets will—

⁶⁸¹ Electricity Networks Association, *Submission on the Draft Input Methodologies Asset Valuation (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Roll Forward*, 20 August 2010, p. 25, paragraphs 95-97; Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Reasons Paper, Asset Valuation*, 23 August 2010, p. 78, paragraphs 234-235; GasNet Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 13, paragraphs 52.

together with the other applicable IMs—indirectly inform the determination of appropriate DPPs for suppliers.

- E13.16 EDBs and GPBs subject to a DPP may be required to first submit financial information as part of the starting price adjustment process. This would include establishing their initial RAB values. If this is the case, the Commission anticipates that it would request the relevant information by issuing a notice under s 53ZD. Such a notice would also set out any audit and verification requirements for establishing (adjusted) initial RAB values.
- E13.17 Suppliers may subsequently propose alternative CPPs that better meet their particular circumstances. Under s 53Q(2)(d), every customised price-quality proposal must apply or adopt all relevant IMs. This will include the IM for the valuation of assets, as it applies to CPP proposals.

Asset valuation in CPP proposals

- E13.18 CPPs will be set based on a building blocks calculation of the regulated supplier's required revenue over the regulatory period. As is discussed in Chapter 2, key components of the building blocks calculation include:
- a. required return on capital over the period, calculated using the projected RAB value (adjusted for the regulatory deferred tax balance, where applicable) for each financial year under a CPP;
 - b. required return of capital, that is projected depreciation, over the period; and
 - c. projected capital expenditure over the period.
- E13.19 Regulated suppliers wishing to apply for a CPP will need to provide projected information, for each year through to the end of the regulatory period, on the following matters:
- a. the rolled forward RAB value;
 - b. total depreciation for assets depreciated using the standard depreciation method;
 - c. total depreciation for assets for which the regulated supplier proposes to use an alternative depreciation method;
 - d. revaluations;
 - e. commissioned assets, grouped by type;
 - f. asset disposals, grouped by type; and
 - g. works under construction.
- E13.20 These projections will be subject to consultation, verification, audit, and certification requirements, set out in Part 5, Subpart 5 of the IM determination for electricity

distribution services, and Part 5, Subpart 6 of the IM determinations for gas distribution services and gas transmission services.

- E13.21 CPP applicants must also provide evidence to support proposed physical asset lives where these differ from the standard physical lives set out in Schedule A of the IM Determination. This requirement is to confirm that the proposed lives comply with provisions dealing with deviations from the standard physical asset lives, and includes independent engineers' reports to justify:
- a. reduced physical asset lives; and
 - b. physical asset lives for assets not covered by Schedule A, and where the RAB does not already contain a similar asset.

CPP proposals for alternative depreciation

- E13.22 An alternative depreciation method may involve a shift to economic asset lives, and/or a different method for calculating the depreciation charge.
- E13.23 CPP applicants may propose an alternative depreciation method under a CPP, where the applicant considers this would better meet the Part 4 Purpose than the standard depreciation method of straight-line depreciation using physical asset lives. Where a CPP applicant proposes an alternative depreciation method, it must provide evidence to demonstrate that this is the case.
- E13.24 The independent verifier will assess the evidence provided, and will determine whether the evidence is sufficient (see Chapter 9 of this Paper). The independent verifier will also be required to provide an opinion as to whether the alternate asset lives or depreciation method better meet the Part 4 Purpose than depreciation using the standard method. In setting a CPP, the Commission may allow the alternative method if satisfied that it does so.

Asset allocations when applying for a CPP

- E13.25 Appendix B, which discusses components and application of the cost allocation IM, explains the process and timing of asset allocations when applying for a CPP.
- E13.26 In summary, asset values must be allocated based on allocations made in the year preceding the assessment period (the last disclosure year of the current period). Where an ID disclosure has been made for that year, the asset allocation in that disclosure may be used. Otherwise the CPP applicant must allocate its assets in accordance with the cost allocation IM as of that disclosure year.
- E13.27 CPP applicants can take into account planned asset sales provided that the sale is either completed between the beginning of the assessment period and the day on which the CPP proposal is submitted or, is 'highly probable' on the day on which the CPP proposal is submitted. Where a completed or 'highly probable' sale is evident at the time a CPP application is made, the CPP applicant must carry out an additional asset allocation as at the end of the last disclosure year of the assessment period.
- E13.28 In preparing forecasts of the rolled forward RAB value for the purpose of a CPP application, regulated suppliers should undertake no further asset allocations.

APPENDIX F: PRIOR REGULATORY PROVISIONS FOR ASSET VALUATION

F1 Introduction

F1.1 As is discussed in Chapter 4, a number of EDBs and GPBs argue that the initial RAB value must be established through a new ODV valuation in 2009 or 2010 because, in their view, s 52A requires this to occur. This appendix addresses a number of other issues raised by EDBs and GPBs concerning the existing valuations prepared under regulatory provisions developed prior to the Part 4 regime. In particular:

- Section F2 summarises the key issues raised by EDBs and GPBs concerning the existing valuations prepared under regulatory provisions in place prior to the Part 4 regime;
- Section F3 provides an overview of the key features of the ODV/ODRC methodology (used in preparing valuations for EDBs and GPBs under prior regulatory provisions), and highlights the Commission's view that the ODV/ODRC methodology results in relatively unpredictable valuation outcomes;
- Section F4 summarises the development of regulatory provisions for valuing EDB assets under the now-repealed Part 4A, and responds to submissions from EDBs that new ODV valuations for EDB assets must be undertaken under Part 4 because there was a commitment to do so under Part 4A; and
- Section F5 responds to submissions from EDBs and GPBs that the existing regulatory valuations are not sufficiently 'robust' for the purposes of Part 4.

F2 Issues Raised Concerning Existing Regulatory Valuations

F2.1 A number of EDB submitters, notably Vector, have strongly argued that new ODV valuations should be undertaken on the basis that, under the now-repealed Part 4A of the Act, the Commission reached a high-level decision in 2005/06 that it would require EDBs to undertake a new ODV valuation in 2008. In the view of these submitters, the Commission must honour this position, despite the significant change in the governing legislation.

F2.2 These submitters have stressed the importance of 'regulatory commitment' in relation to the choice of initial RAB value for EDBs under Part 4. Some submitters referred to this commitment as a 'regulatory compact', where changing outcomes unilaterally should not be expected both from the Commission and from lines businesses.⁶⁸² For instance, Vector has argued that the Commission would be justified in departing from previous principled decisions only when the approach is

⁶⁸² AECT, Input Methodologies Electricity and Gas Workshop Transcript, p. 134, lines 1-14. Also refer: Orion, *Pre-Workshop Submission on Emerging Views*, 3 February 2010, pp. 4-5. In this case, Orion's reference to a 'regulatory compact' is in the context of what Orion considers to be the Commission's past commitment to remedy 'deficiencies' in the 2004 ODV valuations for EDBs (footnote 759 below).

not permitted under the new Part 4, or when the previous approach was illegal, unprincipled or based on factual error; and while new circumstances may justify a different approach going forward, they should not provide the basis for retrospectively changing decisions. Vector noted that one of the key issues in relation to regulatory commitment is “the impact inconsistent decision-making has on investor’s perceptions about how the regulator will behave in the future”.⁶⁸³

- F2.3 As explained below, however, the Commission considers that there were sound reasons why it reached its decision in December 2008, following consultation, that a new ODV would not necessarily be required, and for the adoption of a CPI-indexed valuation approach instead—referred to by the Commission and interested parties as ‘indexed historic cost’ (IHC).⁶⁸⁴ It follows that, although new ODV valuations may conceivably be required in the future under the amended Part 4, nothing done under the old Part 4A requires the Commission to undertake a new ODV valuation at the commencement of the new Part 4 regime (paragraphs F4.1-F4.34).
- F2.4 A number of EDB submitters have also argued that new ODV valuations are to be preferred because the existing regulatory valuations, which are based on 2004 ODVs updated to 2009 for additions, disposals, CPI-indexation and straight-line depreciation, are not sufficiently ‘robust’ for establishing the initial RAB for the purposes of price-quality regulation under Part 4. The Commission responds to these submissions in paragraphs F5.1-F5.18.
- F2.5 Similarly, a number of GPB submitters argue that any earlier valuations undertaken prior to the Part 4 regime are ‘not robust’. The Commission responds to these submissions in paragraphs F5.19-F5.42. First, however, an overview is provided of the key features of the ODV/ODRC methodology.

F3 Key Features of the ODV/ODRC Methodology

ODV valuation methodology

- F3.1 In both New Zealand and Australia, ODV (and ODRC) have been described as giving valuation outcomes consistent with contestable markets.⁶⁸⁵ ODRC has also been described as a method that sets prices at “levels sufficient to finance bypass of the facility in question”.⁶⁸⁶ In that respect, it is intended to reflect the maximum price that could be charged by the incumbent natural monopolist without encouraging entry that would result in the duplication of the entire network (i.e. the

⁶⁸³ Vector Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 16.

⁶⁸⁴ Strictly speaking this is not a true IHC value, which would be based on indexing and depreciating the actual (i.e. ‘historic’) cost of commissioning the assets. The starting point for the 2009 disclosed values is an earlier ODV valuation, which is deemed to be the indexed historic cost (IHC) value at that time (given records on the historic cost of all EDB assets are generally not available). However, appropriate records are available subsequent to that ODV valuation, to establish the IHC value of all assets added to the RAB since then. Over time, as all assets that were originally in the ODV become fully depreciated, the RAB value will become a true IHC value. Both the Commission and interested parties nevertheless refer to an earlier ODV rolled forward in this manner on an ongoing basis as ‘IHC’.

⁶⁸⁵ For example: Commerce Commission, *Regulation of Electricity Lines Businesses, Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Businesses*, 30 August 2004, p 7.

⁶⁸⁶ Gale, S. and McWha, V., *The Origins of ODV*, Report to Air New Zealand by NZIER, Wellington, August 2000, p. 1.

‘hypothetical new entrant’ standard or test).⁶⁸⁷ Consequently, it is claimed that it “effectively sets an economic maximum for the network value.”⁶⁸⁸

F3.2 As is described in Table 4.2 in Chapter 4, ODV is similar to ODRC, but with the addition of an economic value (EV) test. The ODV/ODRC valuation methodology requires decisions on the appropriate:

- principles underpinning the methodology (including whether the network is valued on a ‘greenfields’ or ‘brownfields’ basis, or some combination of the two, as well as the scale of construction at which the network is notionally replaced);
- modern equivalent assets (MEAs);
- standard replacement costs;
- multipliers to, and allowances above, those standard costs to reflect different construction, installation and environmental conditions;
- standard asset lifetimes;
- the depreciation methodology;
- the optimisation methodology; and
- in the case of ODV only, the methodology for an economic value (EV) test.

F3.3 Hence, although the analysis results in an accounting-based valuation, a significant amount of engineering and other analysis and judgement is required to establish an ODV-based methodology, and then to undertake a valuation in accordance with that methodology. In particular, multipliers are typically specified as a range, within which the valuer can exercise his or her judgement.

F3.4 As a result of applying the multipliers and allowances under the ODV methodology, the overall replacement costs assigned to existing assets may be significantly affected by factors such as new legislation or local bylaws that did not apply when the assets were actually installed many years previously (e.g. new local council requirements for ground reinstatement in the case of cable trenching, and new traffic management requirements).

ODV in New Zealand

F3.5 ODV assumes that a hypothetical new entrant duplicates the entire network and supplies the entire existing customer base. In duplicating the network, the hypothetical new entrant is assumed to have access to the most up-to date

⁶⁸⁷ ACCC, *Draft Statement of Principles for the Regulation of Transmission Revenues*, May 1999, p. 39.

⁶⁸⁸ Ernst & Young, *Rationale for Financial Performance Measures in the Electricity Information Disclosure Regime – Including Use of Optimised Deprival Values, and Avoidance of Double Counting of Asset Related Expenses*, a Report to Energy Policy Group, Energy & Resources Division, Ministry of Commerce, for Briefing the Electricity Supply Association of New Zealand (ESANZ), August 1994, p. 6.

technology. On the other hand, it is assumed that this entrant can source these modern equivalent assets ‘second-hand’ (because these assets are assumed to be the same age as the incumbent supplier’s existing assets). Moreover, this hypothetical entrant is restricted to using the incumbent’s network configuration.

F3.6 Consequently, the typical specification of the ODV methodology in New Zealand involves a hypothetical hybrid entrant that comprises a mix of a hypothetical new entrant’s notional characteristics and some of the incumbent’s actual characteristics. Furthermore, it comprises a mix of both ‘greenfields’ concepts (e.g. the significant scale of construction assumption, as well as the use of modern equivalent assets rather than the assets actually installed) and ‘brownfields’ concepts (e.g. assumptions that the entrant uses the existing network configuration, and constructs around existing infrastructure).

F3.7 Mr Jeffrey Wilson of Wilson Cook (on behalf of Powerco) has explained the background to some of these assumptions underpinning the specification of ODV in a New Zealand context. In particular, Mr Wilson noted that:

replacement costs should be based on competitive pricing or estimates thereof, not necessarily the cost of self-construction by the EDBs themselves, and that they should reflect a significant scale of construction (within the limits of available resources), not “piecemeal” additions. This requirement was the origin of the present concept of “scale” of construction.⁶⁸⁹

Unpredictability of ODV outcomes

F3.8 The Commission has previously stressed that the ODV methodology is highly subjective, both in the way that the various rules are specified (which depends on the choice of underlying principles and assumptions in respect of the matters set out in paragraph F3.2), and then how the valuation is undertaken against those rules in practice. There are therefore a wide range of valuation outcomes that could be consistent with the application of ODV. The Commission has therefore stated it would be a misnomer to describe any particular ODV as “accurate”.⁶⁹⁰ For instance, during the Gas Authorisation, different interpretations of the same ODV specification resulted in valuation differences of up to 30%.⁶⁹¹ Ranges of ODRC valuation outcomes in Australia have at times been even higher.⁶⁹²

Views of submitters on the ODV methodology

F3.9 A number of submitters have acknowledged the subjectivity of the methodology and the unpredictability of ODV outcomes, both during the current consultation process under Part 4, and during consultation under Parts 4A and 5 prior to the introduction of the Part 4 regime. For instance, in discussing ODV/ODRC valuations at the February 2010 EDBs & GPBs Workshop, Mr Euan Morton (Synergies on behalf of Vector) stated that:

⁶⁸⁹ Wilson Cook, *Re: Commerce Commission - Electricity Distribution Network Fixed Asset Valuations and Valuation Handbook*, Letter from Jeffrey Wilson to Paul Goodeve (Powerco), 15 March 2010, p. 11.

⁶⁹⁰ Commerce Commission, *Authorisation for the Control of Supply of Natural Gas Distribution Services by Powerco Ltd and Vector Ltd, Decisions Paper*, 30 October 2008, paragraphs D.108-D.109 (Commerce Commission, Gas Authorisation Paper).

⁶⁹¹ *ibid.*, paragraphs 376-397.

⁶⁹² *ibid.*, paragraph E.15.

it seems to me that the ODV process of revaluations is a little bit akin to a lottery. You can win a lottery and do very well, or lose a lottery and lose your money.⁶⁹³

- F3.10 Similarly, Mr Greg Houston (NERA on behalf of Orion) noted at that workshop that “The principle’s clear, but application is far from it.” He acknowledged “there’s a wide range of debate” about ODRC/ODV—he characterised the level of such debate in NZ as scoring a 5, with debates in Australia ranging from 2 to 8.⁶⁹⁴ On another occasion, Mr Houston observed that:

Now of course in applying that concept, because it is a very theoretical concept, you have to deal with the day-to-day realities of you look out and what assets do you have and should you optimise them and greenfields, brownfields, how much optimisation and all of that stuff, and how old are they, what are the depreciation profile. That’s a process that reasonable minds can differ and do differ. But at the end of the day you apply it and you come up with the best you can making the judgments that you need to make. ...

If you’re saying to me that the application of that concept in this context may have imperfections in it I’d be very - rapidly agree. Now what’s the consequence of those imperfections? It’s a very difficult question, different people have different views. Your view may be different to others. But it will have approximations and they will result in imperfections, but we can’t - I don’t think we can say easily what the consequence of those will be. Some people might say gee that depreciation life is too short, some might say it’s too long, some may say that replacement cost is too low, some may say it’s too high.⁶⁹⁵

- F3.11 Similar observations had been made by Vector during consultation on the Gas Authorisation.

MR. STRONG: ... it seems to me that the Commission made its decision to value our assets using the ODV methodology, the outcome of that process could have been any number of outcomes just depending on how asset prices were set in the ODV Handbook, how the optimisation tests were carried out, how the economic value assessments were done, and so that was a risk that was imposed on - a set of risks that was imposed on Vector and we complied with the Handbook and a value popped out.⁶⁹⁶

- F3.12 A number of EDBs and GPBs disagree with the Commission’s characterisation of ODV.⁶⁹⁷ Mr Wilson (on behalf of Powerco and Vector) has submitted that there is “no inherent reason why valuations based on replacement costs are inherently uncertain, arbitrary, variable or inaccurate”, and has observed that Mr Morton and Mr Houston “are economists, not experienced valuers of infrastructure assets.”⁶⁹⁸

Although, like any valuation, the calculation of a replacement-cost based valuation for electricity or gas network assets requires the exercise of professional judgement and

⁶⁹³ Commerce Commission, *Electricity Distribution Businesses and Gas Pipeline Businesses Workshop Transcript*, 25 February 2010, pp. 124-125.

⁶⁹⁴ Commerce Commission, *supra* n 693, pp. 111-112.

⁶⁹⁵ Commerce Commission, *supra* n 690, paragraph D.108.

⁶⁹⁶ From Gas Authorisation Conference cited in: Commerce Commission, *supra* n 690, paragraph D.28

⁶⁹⁷ For example: Vector, *Submission in Response to the Commerce Commission’s Draft Reasons Paper for Electricity Distribution Businesses and Gas Pipeline Businesses, Asset Valuation*, 23 August 2010, pp. 45-46.

⁶⁹⁸ Powerco, *Commerce Commission and Regulatory Asset Bases for Electricity Distribution and Gas Pipeline (Distribution) Businesses, Statement of Jeffrey Webster Wilson*, 21 August 2010, paragraphs 11 and 24; and Vector, *Commerce Commission and Regulatory Asset Bases for Electricity Distribution and Gas Pipeline (Distribution) Businesses, Statement of Jeffrey Webster Wilson*, 21 August 2010, paragraphs 12 and 25.

entails a degree of subjectivity, it does not do so to any greater extent than any other form of valuation.⁶⁹⁹

The Commission's apparent view that ODV valuations are subjective or inaccurate (by inference, subjective or inaccurate to an unacceptable degree) is at odds with its "2004" handbook requirement that valuers certify the accuracy of such valuations to a tolerance of ± 3 percent. At the risk of stating the obvious, both practically and as a matter of professional obligation, a valuer simply would not be able to certify the accuracy of the valuation to the standard if the valuation is inherently uncertain, arbitrary, variable or inaccurate in the way the Commission seems to be suggesting.⁷⁰⁰

Undertaking ODV valuations

- F3.13 In considering the uncertainty in respect of how ODV valuations are undertaken in practice in accordance with pre-existing ODV rules, the Commission highlights that material differences of opinion can, and do, occur between professional valuers. For instance, as stated above, during the Gas Authorisation different applications of the same ODV methodology resulted in valuation differences of up to 30%.⁷⁰¹
- F3.14 At the time, the Commission's valuation advisers, PBA, accepted that an appropriate level of control and verification was applied by Vector and its advisers (i.e. Wilson Cook, PwC and KPMG) in preparing an ODV for its controlled gas pipeline services.⁷⁰² Despite this verification, PBA disagreed with the manner in which Vector had applied its multipliers. Accepting PBA's recommendations resulted in an ODV valuation \$92 million lower than Vector's submission (which was 30% higher). Similarly, in Powerco's case, PBA accepted that appropriate verification was applied by Powerco and its valuation advisers (i.e. SKM and KPMG) in preparing its ODV.⁷⁰³ Again, however, PBA challenged Powerco's application of multipliers. In this case, accepting PBA's recommendations resulted in an ODV valuation \$28 million lower than Powerco's submission (which was 8% higher).⁷⁰⁴

Specifying the ODV methodology

- F3.15 There have been numerous revisions, and/or proposed revisions, to the specification of the ODV methodology for EDBs (and to a lesser extent for GPBs). For instance, prior to the Commission's 2004 ODV Handbook, MED's ODV Handbook went

⁶⁹⁹ Powerco/Wilson, supra n 698, 21 August 2010, paragraph 12; and Vector/Wilson, supra n 698, 21 August 2010, paragraphs 13.

⁷⁰⁰ Powerco/Wilson, supra n 698, 21 August 2010, paragraph 24; and Vector/Wilson, supra n 698, 21 August 2010, paragraphs 25.

⁷⁰¹ This variation of 30% was also cited in the Commission's Draft Reasons Papers. Mr Wilson appears to have understood the reference to the 30% variation to be the difference between Vector's 2005 ODV valuation and its lower 2006 valuation, which Mr Wilson states was an FRS-3 valuation prepared for general purpose financial reporting (Powerco/Wilson, supra n 698, 21 August 2010, paragraphs 20 and 26; and Vector/Wilson, supra n 698, 21 August 2010, paragraphs 21 and 27). As noted in the next paragraph, the 30% figure referred to the difference between the verified 2005 ODV value for Vector first submitted to the Commission, and the revised 2005 ODV value for Vector as recommended by the Commission's consultants, both applying the same specification of the ODV methodology.

⁷⁰² PBA, *Gas Control - Final Review of the 2005 Valuation of Vector Limited's Auckland Gas Distribution Network and Roll Forward of the 2003 Valuation to 2005*, 12 August 2008, pp. 5 and 26

⁷⁰³ PBA, *Gas Control - Final Review of the 2005 Valuation of Vector Limited's Auckland Gas Distribution Network and Roll Forward of the 2003 Valuation to 2005*, 12 August 2008, pp. 5 and 26

⁷⁰⁴ Figures in this paragraph are from: Commerce Commission, supra n 690, paragraph 385 and Table 7.

through four editions between 1994 and 2000, with many changes during this period focusing on improving the consistency of valuations between EDBs.⁷⁰⁵

- F3.16 Mr Wilson has himself drawn attention to the difficulties in determining up-to-date ODV replacement costs to be specified in an ODV Handbook based on the significant scale of construction assumption. This is because, in practice, most construction is on an incremental or piecemeal basis, and so the relevant data can be difficult to obtain or does not exist.

The problems with “scale” (in the sense of determining reasonable replacement costs) occur mainly in the determination of the replacement costs for circuits (viz. lines and cables), rather than in the determination of replacement costs for substations, switchgear or other asset categories. Robust determination of costs relies on having available good data derived from a large number of installations — the sort of data that is generally available only from the larger EDBs or from those with construction businesses of a significant size, operating competitively in the market. [Footnote: Smaller businesses may have difficulty producing such data in statistically significant sample sizes; and the information from construction businesses, if available in detail at all, is likely to be confidential.]

Even the larger EDBs are likely to have sufficient data available only in relation to certain asset sub-categories (e.g. for cables only of certain sizes or for lines only of certain types) and so it is usually necessary to use the data available in the highly populated sub-categories to determine escalation factors for application to the other sub-categories. The figure below illustrates the pattern of data typically available in a highly populated cable sub-category and the need to find a point of compromise. ...

An experienced valuer ought to be able to determine a reasonable level for the replacement costs on this basis and, if the Handbook is to be updated (and thus also its standard replacement costs updated), then the writer considers that useful work could be done through a cooperative approach in the industry that would save a lot of debate, time and trouble. [Footnote: A similar approach was followed successfully by the writer when the original table of replacement costs and lives was developed in 1993/4.]⁷⁰⁶

- F3.17 Although an experienced valuer can determine a reasonable level for replacement costs, in consultation processes intended to assess what those reasonable values might be, there will always be room for a certain amount of judgement, subjectivity and debate. For instance, the Commission’s extensive 12 month consultation process on its 2004 ODV Handbook updated the replacement costs (and introduced changes to the specification of the ODV methodology) after significant debate.⁷⁰⁷
- F3.18 The adjustments to the 2004 ODVs provided for in the IM for establishing the initial RAB have also introduced a number of changes to the specification of the ODV methodology (i.e. changes the scope and range of multipliers to, among other things,

⁷⁰⁵ Commerce Commission, *A Companion Report to the Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Businesses*, 31 August 2004, pp. 62-63.

⁷⁰⁶ Powerco Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, Attachment: Wilson, Cook and Co, *Electricity distribution network fixed asset valuations and valuation handbook: a letter to Powerco Limited*, 15 March 2010., pp. 12-13.

⁷⁰⁷ The issues debated, including those concerning replacement cost values, are reported in: Commerce Commission, *A Companion Report to the Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Businesses*, 31 August 2004, paragraphs 214-231 (for replacement costs); and PBA, *Review of Optimised Deprival Valuation Handbook, Replacement Costs of System Fixed Assets*, Prepared for Commerce Commission, 31 August 2004.

deal with local snow, wind and loose rock conditions). The industry has argued that these changes are appropriate in order to shift the basis of the ODV methodology from greater consistency toward greater accuracy (i.e. to better reflect business-specific circumstances).⁷⁰⁸ If ODV were to have been implemented in future in the asset valuation IM under the Part 4 regime, the Commission would have expected to receive submissions from regulated suppliers on an ongoing basis to change the principles and assumptions underpinning any particular specification of the ODV methodology, most likely in their favour.⁷⁰⁹ Hence, just as the Commission has considered no new ODV revaluation is required to set initial RAB values, it has likewise decided not to implement a valuation roll-forward methodology using ODV.

Conclusion on ODV valuation outcomes

- F3.19 ODV is a methodology involving a number of choices as to what a hypothetical entrant's costs might be, and the extent to which it is appropriate for the actual circumstances of the incumbent to be taken into account instead. A specification of the ODV methodology that 'accurately' reflects a hypothetical new entrant, cannot at the same time 'accurately' reflect all of a particular regulated supplier's actual circumstances. A wide spectrum of possible methodologies could fall within the broad category of an 'ODV' methodology; each reflecting a different perspective as to what circumstances the 'accuracy' of the methodology entails. Even if it were possible to *precisely* prepare an ODV valuation in accordance with a particular specification of the ODV methodology, that valuation could be considered inaccurate when compared to a valuation of the same network using a different specification of the ODV methodology.
- F3.20 By contrast, taking an existing valuation and rolling it forward for actual capital expenditure, depreciation and CPI-indexation—despite some uncertainty inherent in the CPI—provides far more predictable valuation outcomes than periodic ODV revaluations going forward. Certainly the resulting value is objectively verifiable and auditable *ex post*. Prior ODV valuations, by contrast, can always be challenged (just as regulated suppliers are doing now in the context of establishing initial RAB values) on the grounds that the underlying principles and assumptions (many of which are subjective) are 'not fit for purpose'. In any event, apart from urging the Commission to allow them to use ODV one 'final' time to establish initial RAB values, the majority of EDBs and GPBs do not advocate applying ODV ever again in future. Many agree with the Commission's reasoning concerning the advantages of IHC over ODV going forward (paragraph 4.3.82).

⁷⁰⁸ For example, refer: PwC (for ENA), *Adjusting 2009 Information Disclosure Valuations*, Report to the Electricity Networks Association, 9 August 2010, p 4.

⁷⁰⁹ For example, despite the significant scale of construction assumption being intrinsic to the ODV methodology as implemented in New Zealand to that date, during consultation on the 2004 ODV Handbook, EDBs argued strongly that this assumption resulted in unrealistic replacement costs (Commerce Commission, *A Companion Report to the Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Businesses*, 31 August 2004, paragraph 215). Similar arguments have been raised during the current IM consultation process (paragraphs F5.10-F5.12).

F4 Regulatory Provisions for EDB Asset Valuation under Part 4A

Existing regulatory valuations for EDBs

F4.1 Since 2001, the relationship between EDBs and their consumers has been shaped by the information disclosure regime and targeted control (or thresholds) regime under the now-repealed Part 4A of the Act (Chapter 1). These arrangements were deemed to be the initial DPP under s 54J(2) of the Act for those EDBs subject to price-quality regulation under Part 4.

F4.2 The existing regulatory valuations for EDBs as at 31 March 2009 were prepared in accordance with the information disclosure requirements under Part 4A. These information disclosure requirements continue to apply to all EDBs under Part 4 until a s 52P determination made by the Commission under s 54I applies to EDBs (s 54W). The information disclosure regime and the targeted control regime under Part 4A shared a common overall purpose in s 57T and s 57E respectively—namely: “to promote the efficient operation of markets directly related to electricity distribution and transmission services”. The targeted control regime’s full purpose statement (in s 57E) was:

to promote the efficient operation of markets directly related to electricity distribution and transmission services through targeted control for the long-term benefit of consumers by ensuring that suppliers:

(a) are limited in their ability to extract excessive profits;

(b) face strong incentives to improve efficiency and provide services at a quality that reflects consumer demands; and

(c) share the benefits of efficiency gains with consumers, including through lower prices.

F4.3 The objectives in the old s 57E are also reflected in s 52A, supplemented by an additional objective emphasising the importance of incentives to invest. The promotion of outcomes consistent with those produced in workably competitive market outcomes, as required under Part 4, will tend to move market participants closer towards ‘efficient’ outcomes over time (as required by Part 4A).

F4.4 In 2004, EDBs were required to undertake full ODV revaluations in accordance with the Commission’s 2004 ODV Handbook. Under the current information disclosure requirements for EDBs, issued in 2008, these 2004 ODVs have been rolled forward for straight-line depreciation and CPI-indexation. Additions since 2004 have been included at actual commissioned cost (i.e. ‘historic’ cost), and been also subject to CPI-indexation and straight-line depreciation since the date they were first included in the RAB (referred to as ‘IHC’). The requirement to prepare full ODV revaluations in the future was, following consultation, removed from the EDB information disclosure requirements (paragraph F4.29 below).

Significance of past Commission decisions to decisions under Part 4

- F4.5 The Commission is aware of the need for the Part 4 regulatory regime to promote incentives to invest, and certainty is a key component for investment going forward. The purpose of IMs is to promote certainty around the rules, requirements and processes applying to regulation under Part 4. By setting an initial RAB value and the process by which it is to be rolled forward over time, the asset valuation IM will promote certainty for EDBs going forward. Further, both the Commission and EDBs are bound by these IMs (refer s 52S), which reinforces the confidence all parties can have in the future regulatory environment.
- F4.6 The Commission is also cognisant of the importance that decisions across time are as consistent as practicable. That said, the Commission must always operate within the statutory framework provided to it.⁷¹⁰ The Commission is able—and indeed is obliged—to change its approach where this is appropriate. Even a firmly expressed intention must be abandoned if it conflicts with the Commission’s obligations under the new statutory framework.
- F4.7 In 2008, ENA made submissions to the effect that mechanisms were not in place to allow the Commission to make credible regulatory commitments to EDBs. ENA acknowledged that the Commission, at that time, could not bind the decisions of future Commissions, and urged the Commission to reconsider a number of aspects of its 2006 high-level decisions.

New Zealand regulatory institutions do not provide mechanisms for the Commission to provide credible commitments to EDBs that regulatory rules will be stable and certain. Evidence of this includes: ... the Chair of the Commission has stated on a number of occasions that she considers the current Commission cannot bind the decision-making of future Commissions. Legal advice [to ENA] supports this view.⁷¹¹

With the exception of the earlier decision to require a full ODV revaluation in 2008 (which has been postponed to 2009 and is to be subject to further consultation), the proposed Requirements reflect the consultations and consequent decisions that have been made by the Commission since December 2004. These decisions were embodied in decision papers published in October 2005 (high level decisions on all aspects of information disclosure and the approach to valuing the Regulatory Asset Base (**RAB**) for distributors) and April 2006 (further decisions on some of the implementation aspects of the valuation of the RAB) (**Decisions**).

Over that same period other aspects of the regulatory regime for EDBs have also evolved. ... The developments that have occurred or are underway since the Decisions represent significant evolution to the practical implementation of regulation in New Zealand. Detailed investigations, analysis of data and performance, identification of issues and development of solutions and thinking have contributed to this evolution. As so much time has elapsed between the Decisions and the Consultation Package, it was appropriate in our view to consider the Consultation Package in the context of the related events that had occurred in the interim. ...

⁷¹⁰ The Commission also notes that s 52Y of the Act provides that the Commission must review each IM no later than 7 years after its date of publication and, after that, at intervals of no more than 7 years.

⁷¹¹ ENA (on behalf of 23 EDBs), *Submission on the Commerce Commission’s Review of Information Disclosure Requirements*, 7 March 2008; and *Guidelines as to Future Thresholds for Lines Companies*, Letter to Electricity Networks Association from Russel McVeagh, Barristers and Solicitors, 2 December 2005.

The length of time that has elapsed since the initial Decisions combined with the amount of additional analysis and thinking that has emerged through related processes means that the proposal to implement the revised disclosures on the basis of the earlier Decisions must be reconsidered.⁷¹²

- F4.8 Even if the Commission had not been urged to reconsider its approach, the Commission would not have been constrained in its decisions on the initial RAB value, or how to roll forward that value, because of high-level decisions it made under the now-repealed Part 4A. It goes without saying that the Commission must approach its decision-making process under Part 4 afresh. A decision that was signalled under the old statutory framework, in respect of an element that would go into the making of a decision under Part 4A, in no way binds the Commission's decision-making under s 52T. The Commission must enter the Part 4 consultation process with an open mind.
- F4.9 Even if it were minded to, the Commission could not have committed itself in advance to act in a particular way under the new Part 4, and it could never pre-empt the Part 4 consultative process. Observations made in another statutory context, even if broadly applicable under the new Part 4, must at the very least be regarded as subject to submission, further evidence and, where appropriate, reconsideration. Testing its position, refining its view and changing its mind if it regards another view as preferable, is exactly what a decision-maker commits itself to do when it engages in consultation.

Commission's past consultation on asset valuation

- F4.10 Some EDB submitters argue that the Commission committed to requiring EDBs to undertake a new ODV valuation as at 31 March 2008, and that failing to honour this commitment will give rise to uncertainty about future regulatory decisions, increase the cost of capital and diminish incentives to invest.⁷¹³ As noted above, even a firm indication, under the old regime, does not remove the need for it to approach the Part 4 IM exercise with an open mind; the Commission is obliged to formulate IMs in accordance with the Act, and its best judgement.
- F4.11 Having said that, the Commission has had careful regard to the signals it gave when administering the old Part 4A regime. It has also had regard to all submissions on this matter, including a number of submissions including a detailed summation of EDBs' understanding of the asset valuation history.⁷¹⁴

⁷¹² ENA, *Submission on the Commerce Commission's Revised Electricity Information Disclosure Requirements, From the Electricity Networks Association Representing Electricity Distribution Businesses in New Zealand*, 15 August 2008, pp. 9-11.

⁷¹³ See for example, Vector Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, paragraph 13, p. 6.

⁷¹⁴ For example, summaries of this history are provided in: Vector, *Supplementary Post Workshop Submission Summarising Asset Valuation History for Electricity Distribution Businesses*, 14 April 2010; Vector, *Submission in Response to the Commerce Commission's Draft Reasons Paper for Electricity Distribution Businesses and Gas Pipeline Businesses, Asset Valuation*, 23 August 2010, pp 29-54; Vector, *Statement of Simon James Mackenzie, Group Chief Executive of Vector*, 23 August 2010, pp 23-31; and ENA, *Submission 7, Valuation Input Methodology, Initial Regulatory Asset Base*, 20 August 2010, paragraphs 27-36 and Appendix 1. The Commission's own summary of this history was provided in the IM Discussion Paper, pp. 325-329, with a more extensive summary (up until December 2007) in: Commerce Commission, *Regulation of Electricity Lines Businesses, Review of the Information Disclosure*

High-level RAB decisions in 2005/06

- F4.12 The signalling of a new 2008 ODV revaluation to which submitters refer, came from the Commission's 2005/06 high-level decisions on valuing the RAB under Part 4A. In October 2005, the Commission issued a high-level decision that all EDBs should revalue their assets as at 31 March 2004 using the 2004 ODV Handbook, and that these values would be rolled forward in accordance with a consistent ODV valuation update requirement.⁷¹⁵ Subsequently, in April 2006, the Commission issued further high-level decisions about the ongoing revaluations, including the timing of periodic ODV revaluations and how the RAB would be indexed in intervening years.⁷¹⁶
- F4.13 Based on the timetable prevailing at the time, the first such revaluation was expected as at 31 March 2008, prior to the expected 2009 reset of the price path and quality thresholds set under Part 4A, with subsequent revaluations every five years thereafter. In intervening years, the RAB would be indexed using the CPI, and reconciliation between that rolled forward value and the new ODV value would be undertaken under the information disclosure regime in years with a periodic ODV revaluation, with gains or losses relative to the asset values prior to the ODV valuation to be included in income. The April 2006 high-level decision was accompanied by draft implementation decisions on how the reconciliation between the new ODV values, and the rolled forward values of the RAB indexed using the CPI, would be undertaken, and submissions were invited on these draft decisions.⁷¹⁷
- F4.14 The high-level decisions regarding periodic ODV revaluations were not, however, given effect in the Part 4A information disclosure regime. Relevant changes to the information disclosure regime were not made until 2008, and at that time the requirement for future ODV revaluations to be undertaken was removed. In consultation, the Commission noted that subsequent concerns raised by the industry itself about possible investment disincentives, as a result of ongoing periodic ODV revaluations, had led the Commission in 2007 to propose dispensing with ODV as a valuation methodology for EDBs.
- F4.15 Vector has at a number of stages of the consultation process challenged the Commission's sympathy to the concerns raised by the EDBs about periodic ODV revaluations. Vector has submitted that its own understanding was that a significant majority of EDBs supported the Commission's decision in 2005 and 2006 to undertake a new ODV with periodic revaluations. Vector also submitted that all

Regime, Companion Paper to the Exposure Draft of the Revised Information Disclosure Requirements, 20 December 2007, Chapter 5.

⁷¹⁵ Commerce Commission, *Regulation of Electricity Lines Businesses, Valuation of the Regulatory Asset Base, Decision Paper*, 13 October 2005, paragraph 154. This decision paper, and the other related papers on asset valuation, did not set out the Commission's high-level decisions on information disclosure performance measures, such as the ROI. These decisions, along with underlying principles such as FCM and the treatment of revaluation gains as income, were included in: Commerce Commission, *Regulation of Electricity Lines Businesses, Review of the Information Disclosure Regime, Decision Paper*, 13 October 2005, paragraphs 387-396.

⁷¹⁶ Commerce Commission, *Regulation of Electricity Lines Businesses, Valuation of the Regulatory Asset Base (Implementation Matters) for Distribution Line Businesses, Decision Paper*, 13 April 2006, paragraphs 24 and 27.

⁷¹⁷ Commerce Commission, *Regulation of Electricity Lines Businesses, Valuation of the Regulatory Asset Base, Draft Information Disclosure Requirement, Methodology for Rolling Forward the Regulatory Asset Base for System Fixed Assets*, 13 April 2006, paragraphs 24-27 and Chapter 3.

EDBs made strong submissions against the Commission's decision to depart from that approach.⁷¹⁸

Concerns raised by EDBs about ODVs

F4.16 The Commission agrees with Vector that periodic ODV revaluations had widespread support from EDBs in 2005 and 2006, and notes Vector's acknowledgement that the Commission had consistently indicated that expected revaluations would need to be treated as income.⁷¹⁹ The notable exceptions to this support for ODV at the time were Unison and Powerco. Unison favoured indexed historic cost (IHC) over ODV because it preferred *ex ante* prudence reviews under IHC to *ex post* optimisation under ODV.⁷²⁰ Powerco favoured rolling forward the RAB using IHC, supported by an expert submission from Mr Balchin (then at Allen Consulting Group—ACG).

F4.17 Powerco submitted that the ACCC in Australia had determined that the ODV methodology exposes regulated firms to unnecessary risk, and it had therefore moved into line with other Australian regulators that had realised a roll-forward methodology similar to IHC is the most appropriate for remunerating new investment.⁷²¹

F4.18 At that time, the Commission's reasons for undertaking periodic ODV revaluations, rather than IHC, were that:

- submitters were strongly against allowing a choice of valuation methods;⁷²²
- ODV was an “acceptable method” to use “in meeting its statutory requirements” under Part 4A, and only two submitters did not support its use;
- ODV was seen as having an advantage over IHC given that it was a method that EDBs had “considerable experience with”, and therefore the Commission was “confident that in endorsing ODV” submitters were “doing so from a good level of understanding”; and
- unlike IHC, ODV was “currently accepted under GAAP” and therefore “there are almost no further implementation costs and the ongoing compliance costs are known.”⁷²³

F4.19 Subsequent issues raised by the EDBs during consultation, as well as during the Unison post-breach inquiry, led the Commission to reconsider its high-level decision

⁷¹⁸ Vector, *Pre-Workshop Submission on Emerging Views Papers*, 3 February 2010, pp 11-12.

⁷¹⁹ Vector, *Cross-Submission on IM Conference*, 15 October 2009, paragraph 100.

⁷²⁰ As is discussed above (footnote 684), indexed historic cost, in this context, means rolling forward an earlier ODV valuation for the actual cost of additions using CPI-indexation and straight-line depreciation.

⁷²¹ Commerce Commission, supra n 715, paragraphs 104-129. The ACG submission was: ACG, *Review of the Information Disclosure Requirements Cross-Submission*, Memorandum from Jeff Balchin, Director (ACG), to Steve Bolton, CEO (Powerco), 18 April 2005, which cited: Allen Consulting Group, *Methodology for Updating the Regulatory Value of Electricity Transmission Assets*, Report to the Australian Competition and Consumer Commission, August 2003.

⁷²² In 2004, the Commission had proposed allowing EDBs a choice in the RAB roll forward methodology under information disclosure—i.e. between undertaking periodic ODV revaluations and rolling forward the RAB using IHC (with the 2004 ODV values being deemed as the IHC valuations in that year).

⁷²³ Commerce Commission, supra n 715, paragraphs 9-10 and 135.

to undertake periodic ODV revaluations. In particular, it became apparent that, if utilised in price-quality regulation, periodic ODV revaluations might provide disincentives for ongoing investment.

F4.20 A number of submitters had provided specific examples of the differences that can arise between actual capital expenditures (even where incurred at least cost) and the ODV value ascribed to them in the Commission's 2004 ODV Handbook.⁷²⁴ Such differences can arise because, among other things, the standard replacement costs in the ODV methodology are:

- based on Modern Equivalent Assets (MEAs), which may be different from the assets actually installed;
- the costs of the MEAs are based on an assumption of a large scale of construction, and incremental investment does not necessarily enjoy the same scale economies as assumed under the ODV concept; and
- at least some incremental investment involves working around other utility services, maintaining supply to existing customers, and removing existing assets (all factors which increase actual efficiently incurred expenditures).⁷²⁵

Proposals to defer the 2008 ODV revaluation

F4.21 In its submission on the draft IMs, ENA stated that: "In September 2007, the Commission reversed its final decision on the 2008 ODV revaluation, and did so without consultation and without providing reasons at the time for this reversal".⁷²⁶ In fact, the September 2007 paper to which ENA refers—and which Vector characterises as a "deferral decision"⁷²⁷—was a consultation paper. That paper included proposals to defer the 2008 ODV revaluation by one year, and to not require ODV revaluations in 2009 for threshold reset purposes.⁷²⁸ As is discussed in the next subsection, the proposal that ongoing use of IHC might have a number of

⁷²⁴ Commerce Commission, *Regulation of Electricity Lines Businesses, Supporting Paper to the Exposure Draft of the Revised Information Disclosure Requirements, Specification of Return on Investment and Revised Draft Methodology for Rolling Forward the Regulatory Asset Base*, 20 December 2007, paragraphs 36, 44 and 74, which refer to submissions by Unison, CRA on behalf of Unison, Marlborough Lines and Powerco. In particular, refer: CRA, *Rolling Forward the Regulatory Asset Base, Final Report Prepared for Unison Networks Ltd*, 8 May 2006, pp 6-9. Also refer PwC's submissions on behalf of Unison submitted during the Unison post-breach inquiry (PwC, *Optimised Deprival Valuations in the Context of a Post-Breach Inquiry for Unison Networks Limited, Final Report*, 21 October 2005, pp. 14-15; and PwC, *Cross-Submission, Intention to Declare Control on Unison Networks Limited, Draft Report*, 15 December 2005).

⁷²⁵ Commerce Commission, *supra* n 714, paragraphs 328-329.

⁷²⁶ ENA, *Submission 7, Valuation Input Methodology, Initial Regulatory Asset Base*, 20 August 2010, paragraph 32.

⁷²⁷ Vector, *Statement of Simon James Mackenzie*, 23 August 2010, paragraph 6.30.

⁷²⁸ The paper sought submissions on the Commission's intention not to require ELBs to update their ODV Valuations at 31 March 2008, and proposed "as part of a separate threshold reset consultation process ... that full ODV valuations will not be required for 2009 threshold reset purposes. It is proposed that any valuations used would be based on rolling forward the 2004 ODVs through the addition of actual capital expenditure and indexed based on the movements in the consumer price index. How these valuations would be used in resetting the thresholds would also be considered as part of the threshold reset process" (Commerce Commission, *Regulation of Electricity Lines Businesses, Update on the Review of the Information Disclosure Regime and Proposed Change to ODV Disclosure Date*, 27 September 2007). In response to concerns raised by EDBs at the time about the proposed change in approach, the Commission commented at a presentation to ENA (12 October 2007) that while it had not set out clear reasons for its proposals, it would be consulting further on the matter. Further consultation occurred through the December 2007 draft information disclosure package (as is discussed below) and also: Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime, Threshold Reset 2009, Discussion Paper*, 19 December 2007.

advantages over requiring periodic ODV revaluations was subsequently issued for consultation as part of the Commission's December 2007 draft information disclosure package.

- F4.22 ENA (and Vector) also noted in their submissions on the draft IMs that this “reversal” occurred after Vector and Powerco provided the Commission with their 2005 ODV revaluations for their controlled gas pipeline businesses in April 2007, and that these ODV values were significantly above the RAB values previously disclosed for those businesses (paragraphs F5.28 and F5.34).⁷²⁹ Vector stated that the “Commission’s decision to postpone the requirement for EDBs to undertake new valuations came as a major surprise to Vector”, “particularly so given that in mid 2007 the Commission had actually sought tenders for preparing a new ODV Handbook”.⁷³⁰ Nevertheless, in mid-2007, both ENA and Vector were advocating the deferral of 2009 threshold reset process, in light of MED’s review of the regulatory provisions in the Act.

As the Commission is aware, the review of Part 4, 4A and 5 of the Commerce Act is proceeding, with key decisions expected later in 2007 and new legislation expected in 2008. Given this context, it is desirable to consider extending the current thresholds until 2010, so that unnecessary effort is not expended on redesigning thresholds, where a fundamentally different regulatory approach may be pursued.⁷³¹

- F4.23 While the Commission did invite expressions of interest for preparing a new ODV Handbook in June 2007, a few weeks later its public submission on MED’s review highlighted the concerns raised by EDBs about ODV revaluations.

The Commission is aware that many of the concerns raised by distribution businesses about investment incentives specifically relate to the implications of the current implementation of the optimised deprival (ODV) method for valuing distribution network assets. These concerns are particularly relevant to “building blocks analyses” undertaken as part of a post-breach inquiry, but are also relevant in the context of how regulatory asset valuations might be taken into account at the 2009 threshold reset. While the majority of distribution businesses originally supported retaining ODV—over alternatives such as indexed historic cost—further experience with ODV has drawn attention to a number of concerns with the method as currently implemented.

Notably, there is some evidence that the costs of undertaking incremental investments on a day-to-day basis might exceed the assumed standard replacement costs and multipliers in the ODV Handbook (which are based on large-scale construction assumptions). Consequently, the Commission has allowed distribution businesses to roll capital expenditure into the regulatory asset base at cost during the current regulatory period. The Commission continues to consider that ODV, as currently implemented, was an appropriate methodology for establishing opening asset valuations for electricity lines businesses at the beginning of the current thresholds period. The Commission notes that ODV, as well as alternative valuation methodologies, can all be implemented in a manner intended to ensure that financial capital maintenance is maintained. However, in the lead up to the 2009 threshold reset, the Commission intends re-consulting and seeking evidence relevant to the appropriateness of ODV on

⁷²⁹ ENA, *Submission 7, Valuation Input Methodology, Initial Regulatory Asset Base*, 20 August 2010, paragraph 33; and Vector, *Statement of Simon James Mackenzie*, 23 August 2010, footnote 56.

⁷³⁰ Vector, *Statement of Simon James Mackenzie*, 23 August 2010, paragraphs 6.27-6.28.

⁷³¹ Vector, *Proposed Process for Thresholds Reset*, 13 June 2007. Also refer: ENA, *Process for Resetting Thresholds under Part 4A of the Commerce Act 1986*, 1 June 2007.

an ongoing basis, in the wider context of ensuring that appropriate incentives for future efficient investment are preserved.⁷³²

Consultation on not requiring ODVs subsequent to 2004

F4.24 As part of its December 2007 draft information disclosure package, the Commission set out proposals to ensure that reconciliations between rolled forward IHC values, and the new ODV values (in full ODV revaluation years), would be consistent with FCM (Chapter 2). The proposals were intended to address the concerns raised by EDBs about the differences that can arise between actual capital expenditures and ODV values (discussed above). These proposals involved a number of relatively complex adjustments to the ROI calculation, and the proposed development of a new valuation handbook, including two sets of replacement costs—based on making incremental investments, as well as on constructing at a significant scale of construction.⁷³³

F4.25 Given these complexities, the Commission suggested that the ongoing use of IHC might have a number of advantages over requiring periodic ODV revaluations, and highlighted some of the disadvantages of ODV.⁷³⁴ It also reiterated the September 2007 proposal to postpone the requirement that EDBs undertake a full ODV revaluation as at 31 March 2008, which would have been required under the prevailing disclosure requirements.⁷³⁵ The Commission acknowledged that this would be a departure from its previous (high-level) decision, but indicated that:

Rather than be seen as a change in asset valuation methodology that adds to uncertainty, the Commission considers the ongoing application of IHC—which is already intended for intervening years between full ODV revaluations—would markedly improve regulatory certainty over the long term. Any additional uncertainty in the short term would, in the Commission’s view, be outweighed by a more certain and less volatile approach to asset valuation for the future.⁷³⁶

F4.26 In response to these proposals, most EDBs proposed not including the complex ODV reconciliation provisions in the revised disclosure requirements. In addition, the majority of EDBs favoured consulting further on a possible shift to an historic

⁷³² Commerce Commission, *Review of Regulatory Provisions under the Commerce Act 1986: Submission on MED’s Discussion Document*, 6 July 2007, paragraphs 232-233.

⁷³³ Commerce Commission, *supra* n 714, paragraphs 330-334.

⁷³⁴ ENA has acknowledged these complexities during the current consultation process (ENA, *Submission 8, Valuation Input Methodology, Roll Forward of the Regulatory Asset Base*, 20 August 2010, footnote 4).

⁷³⁵ Commerce Commission, *supra* n 714, paragraphs 335-348.

⁷³⁶ *ibid.*, paragraph 349.

cost-based approach,⁷³⁷ and recognised that the outcome of the consultation process might be no further ODV revaluations after 2004.⁷³⁸

F4.27 For instance, PwC (on behalf of 21 EDBs) submitted that:

We have in earlier submissions supported the ODV valuation methodology for valuing the system fixed asset component of the RAB. One of the primary reasons for this support was the degree to which this method has become entrenched in EDB processes, its consistency with GAAP and therefore its relatively low compliance costs. Accordingly it has been a useful approach for setting the opening value of the RAB for EDBs. ...

More recently however a number of factors have emerged which suggest it is appropriate to reconsider these earlier decisions. We therefore support the Commission's proposed further consultation on the appropriate methodology for valuing the RAB. ...

In evaluating alternatives, investment certainty and those options which promote the long term benefits of consumers are of primary importance. We note the Commission's concerns that periodic ODV revaluations may increase regulatory uncertainty due to the *ex post* nature of the optimisation and Economic Value (EV) assessments. We also believe that the task of deriving efficient standard replacement costs, whilst attractive in principle, is difficult in practice. For this reason EDBs may be exposed to additional risk if hypothetical replacement costs are set at unrealistically low levels. ...

We also note the Commission's concerns at the volatility in reported profits caused by the periodic ODV revaluation process (even when valuations are indexed in the interim years). We agree that this volatility will exist, and note that in the past few years input costs, both labour and materials, for distribution assets have increased at a significantly greater rate than the CPI. If full ODV valuations are undertaken in either 2008 or 2009, as per the current proposals, and if the ODV Handbook is appropriately updated to reflect these movements, then there will be significant upwards revaluation adjustments as a result. ...

Alternative approaches based on locking in the 2004 ODV as the opening RAB, and rolling forward without subsequent ODV revaluations would mitigate the volatility in regulatory profit and to some extent regulatory uncertainty. ...

In summary we support further consideration of alternatives to the ODV valuation approach for the RAB. We believe other alternatives will reduce regulatory uncertainty, provide more acceptable mechanisms to ensure investors recover the full costs of their efficient investments and may be more cost effective. ...

Until a final decision is made on the valuation approach for the RAB we believe the changes to the Requirements and the planned ODV revaluation should be delayed.⁷³⁹

⁷³⁷ Most EDBs indicated a preference for DHC over IHC (or over periodic ODVs) on the grounds that DHC provides greater cash flows upfront. For example, refer: ENA (on behalf of 23 EDBs), *Submission on the Commerce Commission's Review of Information Disclosure Requirements*, 7 March 2008, pp. 4-5, paragraphs 8 and 34-36; Marlborough Lines, *Submission on the Exposure Draft of the Revised Information Disclosure Requirements*, 6 March 2008, pp 4-5; Powerco, *Review of the Information Disclosure Regime – 20 December 2007*, 7 March 2008, p 2; CRA (on behalf of Unison), *Comments on Commerce Commission Exposure Draft of Information Disclosure Requirements*, Prepared for Unison Networks, 7 March 2008, p. 10. Vector itself supported further consultation on the issue (Vector, *Submission on the Commerce Commission's Review of the Information Disclosure Regime*, 7 March 2008, paragraph 50). Vector did, however, highlight the impact that, in its view, might be caused by retracting the earlier decision to undertake a 2008 ODV revaluation (*ibid.*, paragraph 48).

⁷³⁸ For example, refer: ENA, *supra* n 737, paragraph 8; and PwC (on behalf of 21 EDBs), *Submission on the Exposure Draft of the Revised Information Disclosure Requirements*, 7 March 2008, paragraphs 81, 83 and 85.

- F4.28 Following consultation on the December 2007 draft information disclosure package, and on a revised draft package in July 2008, the Commission published its revised Part 4A Information Disclosure Requirements for EDBs in October 2008.⁷⁴⁰ The Commission excluded the complex ODV valuation reconciliation provisions from these Requirements, in response to those submissions which identified the significant compliance costs involved (particularly if, following further consultation under Part 4, it was decided that no further ODV revaluations should be undertaken in future).⁷⁴¹
- F4.29 Following an additional round of consultation, the requirement to prepare a full ODV revaluation as at any particular date in the future was removed from the Requirements.⁷⁴² EDBs were required to roll their 2004 ODV valuations forward for capital expenditure, depreciation and disposals, and index the RAB for the CPI, in order to establish RAB values for each year from 2005-2008, as well as for each year thereafter. The Commission agreed to consult further on the ongoing use of an indexed or un-indexed historic cost-based method, but noted that this consultation would likely be relevant for information disclosure determinations under the new Part 4 regime. The Commission noted that it was still open to the possibility of including periodic ODV revaluations under Part 4.⁷⁴³

Effect of reliance on past decisions

- F4.30 In response to a request from the Chair of the Commission at the Energy Workshop that submitters identify the detriment they have/would suffer from the Commission's decision not to undertake new ODVs in 2008 or 2009,⁷⁴⁴ no submitter has identified any to date. Although there have been some general submissions that not undertaking a new ODV would harm investment, no evidence has been provided that investment decisions have been detrimentally affected.⁷⁴⁵
- F4.31 In fact, Powerco's response to the Chair's question highlighted the concern that undertaking future ODV revaluations to roll forward the RAB may itself result in poor investment incentives.⁷⁴⁶ It was this type of submission, including earlier submissions from Powerco, that led the Commission to remove the requirement for periodic ODV revaluations in 2008. Nonetheless, at that time, the Commission indicated its intention to continue consulting on the issue in the context of Part 4,

⁷³⁹ PwC (on behalf of 21 EDBs), supra n 738, paragraphs 64-65, 68-70, 78 and 80.

⁷⁴⁰ Commerce Commission, *Electricity Distribution (Information Disclosure) Requirements 2008*, 31 October 2008.

⁷⁴¹ Commerce Commission, *Regulation of Electricity Lines Businesses, Information Disclosure Regime Companion Paper to the Revised Information Disclosure Requirements*, 31 October 2008, paragraphs 247-249 and 316.

⁷⁴² Commerce Commission, *Update Notice, Regulation of Electricity Lines Businesses, Information Disclosure Requirements, Update on Amendments to the Requirements*, 19 December 2008.

⁷⁴³ *ibid.*, pp. 4-5.

⁷⁴⁴ Commerce Commission, *Transcript of Input Methodologies Electricity Distribution and Gas Pipelines Workshop*, 25 February 2010, p. 137.

⁷⁴⁵ Vector has provided a report attempting to quantify the detriment from the "regulatory opportunism" associated with not undertaking a new ODV (Vector, *Report of Dennis W. Carlton and Gustavo E. Bamberger*, 23 August 2010). The Commission agrees with its Expert Advisors who do not consider this report to constitute "evidence", and who consider the estimates made by Carlton and Bamberger to be "unsubstantiated" (Yarrow, G., Cave, M., Pollitt, M., Small, J., *Review of Submissions on Asset Valuation in Workably Competitive Markets - A Report to the New Zealand Commerce Commission*, November 2010 (Submissions Review), paragraph 43).

⁷⁴⁶ Commerce Commission, supra 186, pp. 136-137.

and the Commission has now done so as part of the consultation process for determining IMs.

- F4.32 It is important to note that, consistent with many of the concerns raised by EDBs about ODV prior to the Part 4 regime, the majority of EDBs still do not support undertaking periodic ODV revaluations on an ongoing basis under Part 4, and for similar reasons. Just as Powerco did in 2005, ENA cites the ACCC's view concerning problems with undertaking ODV revaluations (paragraph F4.17), and agrees with the Commission's reasoning as set out in the EDB Draft Decisions Paper in support of a preference for IHC over ODV going forward.⁷⁴⁷

The ENA recognises it may be possible, in principle, to design a periodic ODV roll forward that better meets the purpose statement requirements relative to the IHC method (taking into account regulatory implementation issues), but such a design has not yet been proposed. ...

In the absence of a well-developed regulatory design that is capable of implementing a periodic ODV method in a manner consistent with the purpose of Part 4, the ENA recommends the Commission adopt the IHC method, along the lines proposed in the Draft Reasons Paper, to roll forward RAB.⁷⁴⁸

- F4.33 Nevertheless, these EDBs support undertaking just one more ODV revaluation, only at the commencement of the Part 4 regime, but keeping all (or at least most of) the benefits of the associated revaluation gains.⁷⁴⁹ ENA argues that there is currently *no* RAB value for "price control" purposes, given that the existing regulatory valuations—based on what ENA now terms "disputed 2004 ODV valuations"—are not sufficiently "robust" or "fit for purpose" for the purposes of price control (i.e. price-quality regulation),⁷⁵⁰ and the current task is to establish a RAB value at the beginning of the Part 4 regime.⁷⁵¹
- F4.34 In conclusion, the Commission is not 'bound' to require new ODV revaluations for EDBs at the commencement of Part 4, whether because of pre-existing regulatory arrangements or on any other basis. The Commission does not consider there was a regulatory commitment. Even if there were, the Commission made a subsequent decision under Part 4A not to undertake a new ODV in either 2008 or 2009, at a time when the industry was itself advocating the change of a number of prior decisions, and advocating the deferral of a number of proposed decisions in light of the review of the Act. Although the Commission remained open to undertaking a new ODV

⁷⁴⁷ ENA, *Submission 8, Valuation Input Methodology, Roll Forward of the Regulatory Asset Base*, 20 August 2010, paragraph 37.

⁷⁴⁸ *ibid*, paragraphs 41 and 43.

⁷⁴⁹ As noted above (paragraph F4.16), Vector acknowledges that the Commission has consistently indicated that revaluations should be treated as income. Vector does, however, also submit that in the event a 2010 ODV would give rise to price shocks, it would be reasonable to smooth the impacts in some manner that meets investors' and consumers' reasonable expectations (e.g. Vector, *supra* n 719, paragraph 15, p. 7, and Post-workshop submission, paragraph 17, p. 8). ENA also notes that s 53P(8) provides the Commission with a mechanism to moderate significant price changes (ENA, *Submission 7, Valuation Input Methodology, Initial Regulatory Asset Base*, 20 August 2010, paragraph 98).

⁷⁵⁰ ENA, *Submission 7, Valuation Input Methodology, Initial Regulatory Asset Base*, 20 August 2010, paragraph 37 and 103.

⁷⁵¹ ENA, *Submission 8, Valuation Input Methodology, Roll Forward of the Regulatory Asset Base*, 20 August 2010, paragraphs 63; and ENA, *Submission 7, Valuation Input Methodology, Initial Regulatory Asset Base*, 20 August 2010, paragraph 36.

revaluation, and consulted on this prospect during consultation on IMs, no evidence has been presented to suggest that doing so would have a positive impact in s 52A(1)(a)-(d) terms relative to the use of existing regulatory valuations.

F5 ‘Robustness’ of Existing Regulatory Asset Values

‘Robustness’ of Existing ODV Valuations for EDBs

F5.1 A number of EDBs have submitted that, in their view:

- the 2004 ODVs are not sufficiently ‘robust’ for establishing the initial RAB for the purposes of price-quality regulation under Part 4 of the Act, and therefore a new ODV valuation should be undertaken;
- the Commission committed to resolving ‘deficiencies’ in the 2004 ODVs should those ODVs ever be used for the purposes of price control; and
- if the Commission were to utilise the 2004 ODVs as part of establishing initial RAB values, EDBs should therefore be permitted to make a number of adjustments to those ODVs (or to the current valuations rolled forward from those ODVs).⁷⁵²

Expectations on making adjustments to past ODV valuations

F5.2 The Commission does not consider there were ‘short cuts’ or ‘deficiencies’ in the 2004 ODVs. A more appropriate characterisation would be that, at the time the Commission was consulting on its 2004 ODV Handbook, a key area of debate concerned any trade-off between the ‘consistency’ and ‘accuracy’ of the resulting 2004 ODV valuations. In addition, there was considerable discussion as to how the 2004 ODVs might be used under the different elements of the Part 4A regulatory regime for electricity lines businesses (i.e. EDBs and Transpower), namely: information disclosure; thresholds; post-breach inquiries; and control.

F5.3 In that context the Commission did note that: “Because consistency of valuations is a less important consideration in assessing the performance of a particular business, the Commission might take into account the business-specific circumstances of any lines business subject to a post-breach inquiry”. The Commission indicated that “during a post-breach inquiry, the Commission intends—where appropriate and relevant—to use the opening ODV valuations prepared using the ODV Handbook as the starting point for deriving the valuation of the system fixed assets component of the regulatory asset base.” The ‘burden of proof’ was to be on an electricity lines business to provide “robust evidence to support asset replacement costs, asset lives or adjustment factors” that were “materially different from the standard values or procedures prescribed in the ODV Handbook”. In the case of control, which was a

⁷⁵² For example: ENA, *Submission 7, Valuation Input Methodology, Initial Regulatory Asset Base*, 20 August 2010, paragraphs 3-12.

possible consequence of a post-breach inquiry, the Commission even noted that it “may decide a full valuation and capital expenditure audit is required.”⁷⁵³

- F5.4 The Commission’s statements were not a binding commitment to do business-specific adjustments to the 2004 ODVs in every case. Nor was it a concession that the 2004 ODVs were ‘deficient’. Although EDBs requested more guidance on examples of how business-specific circumstances would be taken into account during a post-breach inquiry or control, the Commission was careful not to indicate when and what specific adjustments might be made.⁷⁵⁴ One reason for this was because the Commission considered that it could not pre-judge what form control might take.⁷⁵⁵
- F5.5 Although the Commission initiated a number of post-breach inquiries under Part 4A, the possibility that business-specific circumstances could result in consideration of an adjusted 2004 ODV never eventuated. No final decision on a post-breach inquiry for an electricity lines business involved a full building blocks analysis, because no post-breach inquiry resulted in price control being imposed. As such, the Commission did not need to form a view on whether any such adjustments ought to be made.
- F5.6 In the case of Transpower’s 2008 administrative settlement, however, the initial RAB for the settlement was explicitly based on an unadjusted 2006 ODV valuation found by applying the 2004 ODV Handbook. Despite Transpower’s 2006 ODV valuation being based on out-of-date replacement costs (given that the 2004 ODV Handbook used to prepare the valuation was based on 1998 replacement cost values, unlike the 2004 values used for EDBs), the Commission concluded that Transpower did not need to revalue its assets at all for its financial capital to be maintained.⁷⁵⁶
- F5.7 Finally, the Commission’s statements about possibly taking into account business-specific circumstances in the 2004 ODVs were made at a fairly early stage of the Commission’s thinking about asset valuation in the context of the different regulatory instruments under Part 4A. This was at a time when a choice in roll-forward valuation methodology was being considered,⁷⁵⁷ when ‘contestable market outcomes’ were seen as being an appropriate theoretical underpinning for the 2004 ODVs, where ‘accuracy’ was still considered as being a meaningful term in

⁷⁵³ Commerce Commission, *A Companion Report to the Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Businesses*, 31 August 2004, p. 27.

⁷⁵⁴ For instance refer: Commerce Commission, *Hearing Re Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Businesses*, 14-16 April 2004, pp. 23-24 and 351-354. The Commission also noted that “it would be premature for the Commission to comment on the relevance of ODV valuations—or valuations based on another methodology—to resetting the thresholds for distribution businesses in 2009. If an analysis of relative lines business performance is a factor in resetting the thresholds, then consistent asset valuations disclosed during the previous few years may well be relevant. However, the ability of those valuations to accurately reflect business-specific circumstances is likely to be less important” (Commerce Commission, *supra* n 753, paragraph 87).

⁷⁵⁵ For example, refer: Commerce Commission, *Transcript of Intention to Declare Control: Unison Networks*, 17 November 2005, pp. 68-69, 103-105, and 131-132.

⁷⁵⁶ Commerce Commission, *Decision and Reasons for Not Declaring Control of Transpower New Zealand Limited & Decision to Reset Transpower’s Thresholds*, 13 May 2008, paragraph 282. Although at one stage Transpower proposed that the 1998 replacement costs in the 2004 ODV Handbook should be updated, this was solely for the purposes of adjusting the RAB roll forward calculation from 1998-2006, and not for the purposes of adjusting either the 2006 (or 1998) ODV valuation (*ibid.*, pp. 59-67).

⁷⁵⁷ For example: Commerce Commission, *supra* n 753, paragraphs 61 and 82.

respect of ODVs, and when periodic ODV revaluations were seen as providing appropriate incentives for efficient investment.

- F5.8 As is discussed above (paragraphs F4.10-F4.29 and F3.8), since that time, and prior to the commencement of the current Part 4 regime, the Commission decided not to allow a choice in valuation roll-forward methodology, queried the contestable markets basis for asset valuation (and rejected it in the case of the Gas Authorisation), stated that it would be a misnomer to describe any particular ODV valuation as ‘accurate’, and acknowledged that the use of modern equivalent asset values, optimisation and EV tests in the ODV methodology may actually provide disincentives for investment. As is also noted above (paragraph F4.7), the industry has acknowledged the degree to which the regime has evolved over that period. While mindful of the importance of decisions across time being as consistent as practicable, in exercising its functions under Part 4, the Commission is not bound by any past suggestions, indications or decisions made under Part 4A (paragraph F4.34 above).

Adjustments to 2009 disclosed valuations

- F5.9 Without prejudice to its position that a new ODV based on its proposed 2010 ODV Handbook would be the best approach, ENA commissioned PwC and SKM to review the disclosed 2009 asset values for EDBs, and to recommend how the “flaws” in them could be corrected.⁷⁵⁸ As is discussed in Chapter 4, the Commission has effectively accepted the proposed changes to those values proposed by PwC/SKM noting, however, that it does not consider these adjustments are necessary to promote the Part 4 Purpose. Nonetheless, making such adjustments, and precluding future adjustments to the 2009 initial RAB values effectively draws a ‘line in the sand’ and, once the adjustments have been undertaken, provides a certain starting point for the Part 4 regime.
- F5.10 Nonetheless, the Commission notes that, despite the large number of submissions concerning the purported deficiencies in the 2004 ODVs on which the 2009 disclosed values are based, it is striking how few adjustments PwC/SKM recommended on ENA’s behalf (refer Appendix E). Although there will be some uncertainty as to what the exact initial RAB values will be prior to making the adjustments provided for in the asset valuation IM, these adjustments are narrowly targeted. The EDBs themselves will have sufficient information from the IM to be able to determine what the uplift in their 2009 disclosed values will be.

⁷⁵⁸ PwC/SKM’s recommended adjustments are largely of the same kind as the subset of adjustments recommended by Mr Wilson, where 2004 is the relevant year for restating valuations (Powerco, *Commerce Commission and Regulatory Asset Bases for Electricity Distribution and Gas Pipeline (Distribution) Businesses, Statement of Jeffrey Webster Wilson*, 21 August 2010, paragraph 69; and Vector, *Commerce Commission and Regulatory Asset Bases for Electricity Distribution and Gas Pipeline (Distribution) Businesses, Statement of Jeffrey Webster Wilson*, 21 August 2010, paragraph 70). In his submissions on the draft IMs on behalf of Powerco and Vector, Mr Wilson clarifies that he was not proposing updating variable parameters of the valuation since 2004, such as using up-to-date replacement costs, unless the valuation is to be made as at a later year than 2004. If the valuation is not to be made as at 2004, but as at a later year, Mr Wilson states that a new valuation would be required to meet a “satisfactory standard of valuation” (ibid, paragraph 73). The Commission notes that, under its roll-forward methodology, no new valuations will be undertaken. The initial RAB value in 2009 will be rolled forward for subsequent capital expenditure, depreciation, indexation and disposals. Likewise, the initial RAB value will be rolled forward from the 2004 ODVs, having made a number of adjustments to those 2004 ODVs, and making asset register corrections in respect of the 2004-2009 period.

F5.11 It is noteworthy that, while some submitters have argued that the 2004 ODVs should be based on the *actual* costs of assets, PwC expressly rejects such a view.

We also support the draft determination which excludes from the scope of adjustments to the opening RABs, a change to the principles which underpin the 2004 ODV, such as scale of construction. As noted previously, we have always understood the rationale for these principles and believe they are consistent with the regulatory framework⁷⁵⁹

F5.12 The Commission agrees with PwC that the use of actual costs incurred on a piecemeal or incremental basis would be inconsistent with the significant scale of construction assumption, and would therefore be a change to the principles/assumptions underlying the ODV methodology. Although subsequent consultation might have changed the approach, any EDBs which formed expectations that a new ODV would be based on actual incremental costs were ignoring the way that ODV had been implemented in New Zealand since the early 1990s.

F5.13 The Commission acknowledges that some EDBs' arguments about the standard replacement costs in the 2004 ODV Handbook being lower than actual costs might be a valid argument against using the 2004 standard replacement costs for the purposes of rolling forward the RAB. Doing so would likely mean that an EDB would not be able to make a normal return on the efficient historic costs of its assets since 2004 (i.e. current replacement costs at the time that the incremental investments are made), which would not be consistent with FCM going forward. As discussed above (paragraphs F4.19 - F4.20 and F4.25), this is one of the key reasons why ODV is problematic as a roll-forward methodology, and why the Commission proposed not requiring periodic ODV revaluations in response to submissions from a number of EDBs.⁷⁶⁰

F5.14 By contrast, when establishing an initial or opening valuation as at a particular date, these concerns would only be valid if the resulting ODV valuation were so low that an EDB could not make a normal return on its (efficient) historic investments prior to the initial valuation date. One of the features of any replacement cost valuation methodology like ODV, however, is that allowing EDBs to revalue their sunk assets by reference to current replacement costs can provide them with a return on investments that they have never made, and can allow them to recover costs that

⁷⁵⁹ PwC (on behalf of 20 EDBs), *Submission to the Commerce Commission, Input Methodologies for Electricity Distribution Services, Draft Reasons Paper and Associated Draft Determinations (3), Asset Valuation*, 19 August 2010, paragraph 31. Also refer Wilson Cook, *supra* n 689, pp. 3 and 11. For example, Orion has submitted that the replacement costs in the 2004 ODV Handbook were below its actual incremental costs, even where competitive tenders were used (i.e. submissions by Orion from 2004 and 2005, cited in: Orion, *Submission on Reset of Default Price-Quality Path for Electricity Distribution Businesses*, 17 July 2009, pp. 7-8; in turn, cited in: Orion, *Post-Workshop Submission on the Electricity Distribution Emerging Views Workshop*, 15 March 2010, paragraph 23). Also refer: Unison Networks Limited, *Appendix: Responses to questions on Input Methodologies Paper*, 14 August 2009, p. 36. In addition, Vector noted that, in submitting on the 2004 ODV Handbook it had "argued for a 'principled approach' to valuations. This principle would involve the Commission mandating the use of *actual* costs of assets in preparing ODVs, where these could be shown to represent an efficient level of costs" (Vector, *Statement of Simon James Mackenzie*, 23 August 2010, paragraph 6.16).

⁷⁶⁰ MED's information disclosure regulations for EDBs were grandfathered over as the Commission's initial information disclosure requirements in 2004. These included some provisions regarding the roll forward of the RAB. The replacement cost values in the 2004 ODV Handbook were expected to be used for valuing capital additions to the RAB which contributed to the sorts of problems to which the EDBs refer. This problem was rectified in the Commission's 2008 Electricity Information Disclosure Requirements which permit capital additions to be rolled into the RAB at cost.

they have never incurred (such as subsequent asset price inflation, higher reinstatement costs, and new traffic management costs).

Appropriateness of basing the Initial RAB Value on an ‘inaccurate’ ODV valuation

F5.15 A number of submissions on behalf of regulated suppliers have argued that it is inconsistent for the Commission to raise issues about the accuracy of the ODV methodology on the one hand, and on the other to establish initial RAB values for 2009 based on ODV valuations (albeit ones from earlier years). For example, Mr Wilson submitted that:

If the Commission is so uncertain about the accuracy of ODV valuations (and by implication depreciated replacement cost calculations) as a matter of principle, it is unclear to me how it can bring itself to undertake its building block calculations in these two industries or in any other without being overcome by a paroxysm of fear and uncertainty – or, at least, by a lack of conviction in relation to the foundation of its arguments.⁷⁶¹

F5.16 The Commission stresses that its decision to use existing regulatory valuations, rolled forward to 2009, as the basis for the initial RAB value, is not because those existing regulatory valuations were undertaken using some form of the ODV or ODRC methodology. The Commission favours using those valuations simply because they were the valuations established under the regulatory provisions immediately prior to Part 4, and were considered ‘fit for purpose’ by the Commission at the time.

F5.17 Given that a range of valuation methodologies, and a range of asset values in 2009, could be consistent with workably competitive market outcomes, as is discussed in Chapter 4, the Commission has considered whether there is evidence to support moving away from the existing regulatory valuations. The Commission has concluded that there is not. Upward revaluations sought by the EDBs might be warranted if the EDBs had been able to demonstrate that prices set on the basis of existing regulatory values would not maintain their efficient financial capital (i.e. earning at least a normal return on past efficient investments). They have not done so. In the absence of such s 52A(1)(a) benefits justifying upward revaluations, implementing upward revaluations would only serve to underpin increased prices, with no resulting benefit to consumers over the short or long-term.

F5.18 In fact, upwardly revaluing *any* prior regulatory asset value—irrespective of the methodology used to determine that value—would be unwarranted, as long as that existing value is not inconsistent with workably competitive market outcomes, and is at a sufficiently high level to maintain the efficient financial capital of the regulated supplier. Hence, the apparent ‘accuracy’ of the EDBs’ existing valuations in accordance with any particular valuation methodology, is not the critical factor that the EDBs make it out to be, given that a number of different valuation methodologies (or different specifications of a particular valuation methodology) can result in asset values consistent with the Part 4 Purpose.

⁷⁶¹ Powerco/Wilson, supra n 698, 21 August 2010, paragraph 25; and Vector/Wilson, supra n 698, 21 August 2010, paragraph 26.

'Robustness' of Existing ODV/ODRC Valuations for GPBs

ODV valuation methodologies for GPBs

- F5.19 MED published a draft handbook setting out an intended mandatory ODV methodology for the valuation of GPBs under the gas information disclosure regulations in June 2000. This draft was based on the ODV methodology for electricity lines businesses at that time. MED prepared a second draft in 2002, taking account of submissions received, however it was never formally circulated or completed. Changes to the gas disclosure regulations were put on hold pending the outcome of the Commission's Gas Control Inquiry under the old Part 4 of the Act, which was completed in November 2004.
- F5.20 Following the completion of the Gas Control Inquiry, the Commission published an ODV valuation methodology during consultation on the final Gas Authorisation relating to Powerco's and Vector's controlled gas pipeline services.⁷⁶² Other GPBs were not involved in the public consultation process leading to the publication of this methodology. In preparing this ODV Methodology, the Commission considered MED's June 2000 and 2002 draft Gas ODV Handbooks, the Commission's 2004 ODV Handbook for ELBs, expert advice from external consultants, as well as submissions from the controlled businesses, as source material for its valuation methodology document. Powerco and Vector were then required to undertake ODV valuations by applying the methodology set out in that document to establish consistent ODV valuations as at 30 June 2005. These valuations were not, however, used in setting the terms of the final Gas Authorisation (paragraphs F5.27-F5.32 below).

Gas Control Inquiry valuations

- F5.21 Consistent with the recommendation during the Government's 2001 Gas Sector Review to undertake a one-off review of the prevailing ODV valuations, during the Gas Control Inquiry the Commission published a report reviewing the most recent ODV valuations for GPBs that were available (typically as at 2002 or 2003).⁷⁶³ This consistency review, undertaken for the Commission by EMCa, found that the June 2000 version of MED's draft Gas ODV Handbook had become a *de facto* standard for asset valuation in most respects, although all GPBs had some departures from that methodology with varying levels of significance. Some of the departures represented changes that had been suggested through submissions on the draft, and some of those changes had been incorporated into MED's September 2002 'second draft' ODV Handbook.
- F5.22 The Commission concluded that normal returns can be assessed using either a historic cost or replacement cost-based valuation as long as the relevant methodology is applied consistently with FCM (referred to during the Inquiry as NPV=0).⁷⁶⁴ Consequently, the Commission also commissioned a report reviewing

⁷⁶² Commerce Commission, *Authorisation for the Supply of Natural Gas Distribution Services by Powerco and Vector – Valuation of the Opening Regulatory Asset Base – Valuation Methodology*, 15 February 2007.

⁷⁶³ Energy Market Consulting Associates (EMCa), *Gas Control Inquiry: Consistency Review of ODV Network Asset Valuations*, February 2004.

⁷⁶⁴ Commerce Commission, *Gas Control Inquiry Final Report*, 29 November 2004, paragraphs 5.30-5.36 and 8.78.

the issues that would be involved in reconstructing historic cost valuations for the gas pipeline business.⁷⁶⁵

F5.23 As a result of these two reviews, the Commission concluded that the use of a historic cost approach to the valuation of the RAB for the Inquiry was not possible, as the records to support a robust depreciated historic cost (DHC) valuation were not available for the majority of the gas pipeline businesses. By contrast, the Commission concluded that the GPBs' ODV valuations were more robust than their historic cost valuations and were reasonably comparable between businesses. The only exception was Powerco's 2002 ODV valuation.⁷⁶⁶ One of the key issues with Powerco's original 2002 ODV valuation—which was nonetheless considered suitable for the purposes of the Gas Control Inquiry—was that the valuations of its component networks had been conducted at different times, by the previous owners of those networks, utilising different implementations of the ODV methodology and different valuation advisers.⁷⁶⁷

F5.24 Hence, for the purposes of the Inquiry, the Commission relied on the ODV-based valuations as the basis for assessing 'excess' (i.e. above-normal) returns earned by the GPBs. However, the Commission concluded that, as a result, its excess returns analysis was conservative—i.e. favoured the suppliers. This was because any revaluations that had occurred prior to the analysis period (i.e. pre-1997 for Powerco, and pre-2000 for Vector) had not been considered—in particular, those arising from the switch from DHC to ODV.⁷⁶⁸

The major weakness of using ODV is the possibility of obscuring excessive returns that might have arisen for those businesses that switched from historic cost to ODV valuation prior to the period of analysis, and did not adjust prices accordingly.⁷⁶⁹

F5.25 Vector subsequently challenged the Commission's approach to recognising the 2003 ODV revaluation of the Vector (Auckland) assets, as part of its judicial review proceedings of the Gas Control Inquiry. Vector argued that the Commission's analysis ought to have reflected the change in ODV methodology back in 1999, at the time of the previous ODV valuation, which would therefore have placed it outside of the analysis period for Vector. Doing so would have reduced the amount of Vector's excess returns identified by the Commission. In the High Court judgment at paragraph [29], Wild J concluded that: "Nothing Vector has put forward persuades me that that decision was not one reasonably open to the Commission."⁷⁷⁰

F5.26 A PwC expert appearing for Vector during those proceedings—and who had been involved in the preparation of MED's draft 2000 ODV Handbook, that had been used by Vector to prepare its 2003 ODV Valuation—stated that Vector's 2003 ODV

⁷⁶⁵ Cranleigh Strategic, *Gas Control Inquiry Asset Valuation – the Historic Cost Approach*, April 2004, cited in Commerce Commission, *Gas Control Inquiry Final Report*, 29 November 2004, paragraph 8.48.

⁷⁶⁶ Commerce Commission, *Gas Control Inquiry Final Report*, 29 November 2004, paragraphs 8.31 and 8.79.

⁷⁶⁷ EMCa, supra n 763, paragraph 2.5.

⁷⁶⁸ Commerce Commission, *Gas Control Inquiry Final Report*, 29 November 2004, paragraphs 4.29 and 8.29.

⁷⁶⁹ *ibid*, paragraph 8.80. The Gas Authorisation Decisions Paper (supra n 690, paragraphs D.114-D.115) also noted the Commission's view that not only a change in valuation method may cause revaluation gains (e.g. from DHC to ODV); so too can a change in the specifics of the valuation methodology as implemented (i.e. different specifications of the ODV methodology).

⁷⁷⁰ *Powerco Ltd and Anor v Commerce Commission and Anor*, HC CIV-2005-485-1066, 24 December 2007.

valuation represented “a step change” that was “unlikely to be repeated” again. PwC also appeared to have considered the methodology specified at the time to be consistent with the valuation principles and the regulatory framework within which the valuations were to be used:

The publication of the industry specific Handbook in 2000 therefore introduced a significant step change into the valuation process for all GPBs including Vector, as it introduced industry standard assumptions consistent with the ODV approach for the first time. This step change is unlikely to be repeated because it represented the initial introduction of the sector specific methodology.

This conclusion is supported by the desire of the Ministry of Commerce to achieve consistency and robustness in the ODV valuations and its development of an ODV Handbook in 2000. The 2000 ODV Handbook includes assumptions which are consistent with ODV principles. The same cannot be said about the 1999 Ernst Young ODV, as the divergence between the assumptions indicates that the assumptions made for the 1999 valuation may not have been consistent with the ODV principles in all cases (specifically in the use of average current replacement costs and asset lives and the approach to economic value assessments).

The revaluation of Vector’s Auckland gas distribution assets that occurred between the 1999 and 2003 valuations reflected the formal adoption of not only the ODV methodology, but valuation assumptions which were, for the first time, specifically developed by independent advisers to ensure they were consistent with the valuation principles and the regulatory framework within which the valuations were to be used.⁷⁷¹

Use of Gas Control Inquiry valuations in the Gas Authorisation

- F5.27 In its Gas Authorisation Draft Decisions the Commission acknowledged that the Gas Control Inquiry Final Report had described Powerco’s earlier ODV valuations as not as “robust” as those prepared by the other GPBs. Because the earlier ODV valuations for Powerco and Vector had been undertaken on a basis that was not consistent with each other, the Commission considered that it would be preferable for a standardised ODV methodology to be applied by both businesses, which is why it initially developed the ODV methodology employed by Powerco and Vector to prepare their 2005 ODVs.⁷⁷²
- F5.28 Powerco and Vector strongly advocated using these 2005 ODVs as the basis for setting maximum allowable revenues under the Gas Authorisation, but without recognising any revaluation gains arising from the revaluation as income. In its draft decisions, the Commission did propose using these 2005 ODVs to set allowable revenue. However, it also proposed amortising the associated revaluation gains over the residual lifetime of the assets to ensure that Powerco and Vector would not make excessive profits going forward as a result of the revaluation.
- F5.29 At the conference on the Commission’s draft decisions, however, the Commission’s Chair noted that the availability of Powerco’s Revised 2002 ODV Valuation, prepared since the Draft Decisions Paper was released—and which Powerco had prepared using the same methodology that Vector had applied in preparing the 2003 ODV valuation for its Vector (Auckland) assets—potentially addressed the consistency issues between Powerco’s 2002 and Vector’s 2003 ODV valuations.

⁷⁷¹ Affidavit of Lynne Maree Taylor, cited in Commerce Commission, supra n 698, paragraph D.113. .

⁷⁷² Commerce Commission, supra n 698, paragraph 392.

F5.30 Nonetheless, during the Gas Authorisation consultation process, both Vector and Powerco argued that any ODV valuations undertaken as at dates prior to 2005 were flawed (and, during consultation on the IMs, they have continued to argue that these valuations are not of a satisfactory standard).⁷⁷³ For instance, Vector submitted that:

[t]he work that has been undertaken by the Commission, its advisors, the regulated companies and others since that time has indicated that the draft handbook was not robust, and that significant changes in the methodology were justified Although that information was not available in 2003, it is available now. Adopting a starting valuation that was based on a valuation approach now known to be outdated would not be appropriate.⁷⁷⁴

F5.31 In its Final Decisions Paper, the Commission referred to the Chair's comments at the Gas Authorisation conference in responding to Vector's claim that its 2003 ODV Valuation was not robust.

Vector submitted ... that the 2003 valuation as acknowledged by all including the Commission is flawed and unreliable. I just want to take you to the EMCA's 2004 review of Vector's 2003 ODV that was undertaken during the inquiry on behalf of the Commission, and what they said at the time was apart from the matter of optimisation time horizon which EMCA expected to reduce Vector's ODV by 1.4 to \$3.4 million; "This valuation appears to be materially consistent with MED's draft handbook and with the more recent valuations by other gas businesses. If the Commission wish to make use of this valuation for its analysis then subject to confirmation from Vector we believe it could do so and that no further information would be required from Vector".

In response Vector submitted that MED's draft ODV Handbook should be updated to ensure that the asset values used in the Commission's analysis are optimal. Notwithstanding that position, however, Vector also stated that Vector "agrees that the 2003 ODV valuation for Vector is robust". In responding to the specific issues raised by EMCA's review of the 2003 ODV Vector stated that, "adjusting for those issues would involve a significant amount of work to calculate what will ultimately be an immaterial adjustment.["] Rather Vector submitted it was the valuations prior to the 2003 ODV valuation which were not robust and therefore the revaluation gain the Commission had calculated in respect of the 2003 revaluation was an overestimate.⁷⁷⁵

F5.32 The Commission's ODV valuation advisers at the time (i.e. PBA) stated that "PB Associates generally does not believe that retrospective improvements to correct for possible earlier shortcomings should now be made." The Commission did, however, on PB Associates' recommendation, permit a number of adjustments to the Vector (Auckland) 2003 ODV before using that ODV to determine maximum allowable revenues for the Gas Authorisation (which resulted in an increase in the 2003 ODV value of 4.4 percent).⁷⁷⁶ These adjustments were intended to provide consistency of Vector (Auckland)'s 2003 ODV with Powerco's revised 2002 ODV (which had been largely prepared in 2007 using the ODV methodology applied by Vector for

⁷⁷³ For example, refer: Vector, *Statement of Duncan Ian Head*, 23 August 2010, pp. 14-20 and 22-28; and Vector, *Commerce Commission and Regulatory Asset Bases for Electricity Distribution and Gas Pipeline Businesses, Supplementary Statement (19 November 2010) of Jeffrey Webster Wilson*, 19 November 2010, pp. 8-15. Appendix E responds to these submissions.

⁷⁷⁴ Vector, *Cross Submission on the Gas Final Authorisation Draft Decisions*, 18 March 2008, paragraph 122.

⁷⁷⁵ Commerce Commission, *Authorisation of Gas Distribution Services Conference, Transcript*, February 2008, pp. 65-66. The Chair was quoting from: Vector, *Submission on the Commerce Commission's Gas Control Inquiry Draft Report*, 2 July 2004, paragraphs 7.9, 7.15 and 7.17.

⁷⁷⁶ PBA, *Gas Control - Final Review of the 2005 Valuation of Vector Limited's Auckland Gas Distribution Network and Roll Forward of the 2003 Valuation to 2005*, 12 August 2008, pp. 13-14.

that ODV), and were not made as a result of any concerns about the apparent accuracy of the valuations.⁷⁷⁷

Suitability of existing regulatory valuations

F5.33 The Commission considers that the valuations it has proposed for establishing the initial RAB are sufficiently ‘robust’ for that purpose. Given that there is a wide range of possible specifications for implementing ODV/ODRC methodologies (paragraphs F3.8-F3.20), the Commission does not consider that significant adjustments to these valuations would be justified. The situation differs for GPBs compared to EDBs. Unlike GPBs, a common specification of the ODV methodology has been applied to all EDBs as at the same date, and common adjustments to that methodology, or to valuations prepared in accordance with that methodology, can be readily undertaken (subject to appropriate verification). Although the Commission does not consider the adjustments it is allowing to EDBs’ existing regulatory valuations are required for consistency with the reference to workably competitive markets in the Part 4 Purpose, the scope of the adjustments are relatively narrow, and making the adjustments draws a line under any pre-existing valuation disagreements.

F5.34 In the case of GPBs, the alternative advocated by Vector and Powerco—undertaking a new ODV revaluation for gas pipeline assets using a new up-to-date ODV Handbook—would likely result in valuations so high that they would be clearly inconsistent with workably competitive market outcomes. For instance, in referring to its 2005 ODVs for its controlled gas distribution services, Vector’s Group Chief Executive has stated that:

We clearly recognised that the 2005 ODV Valuations presented the Commission with a problem, in that the starting valuation was nearly two times higher than that provided by the inaccurate numbers derived in 2003. ... It was never Vector’s expectation that such an increase would immediately enable us to impose significant price increases on our controlled gas distribution businesses’ customers. Indeed, we could not have done so either commercially or even politically in any case. For example, a lot of these customers could simply have substituted their gas energy use for electricity.⁷⁷⁸

F5.35 Similarly, Powerco has stated that: “Going forward, Powerco is very effectively constrained by customer price sensitivity in gas pipeline markets.”⁷⁷⁹ As is discussed in Chapter 2, competitive constraints come from a range of sources, including the threat of substitute goods or services. If prices based on those valuations would cause gas consumers to switch to electricity, then Vector’s 2005 ODV valuations are clearly not consistent with workably competitive market outcomes. Given a 2009/10 ODV valuation would likely be even higher than the 2005 ODVs, the same would be the case for new ODV revaluations.

⁷⁷⁷ *ibid.*, p 15. Given Powerco undertook its 2002 ODV valuation used in the final Gas Authorisation in 2007, it was not possible to know what information Powerco would have been able to rely on in 2002 in deciding the appropriate assets to which rocky ground multipliers should have applied. Consequently, Powerco utilised the relevant information it had available when it had prepared its 2005 ODV. Therefore, for consistency, Vector was also permitted to extend its application of rocky ground multipliers, based on the relevant information it had available when preparing its 2005 ODV.

⁷⁷⁸ Vector, *Statement of Simon James Mackenzie*, 23 August 2010, paragraphs 6.54-6.55.

⁷⁷⁹ Powerco, *Submission 3 in Response to Draft Input Methodology Decisions and Determinations, Asset Valuation*, 20 August 2010, p. 30.

- F5.36 In the case of MDL, the Commission notes that its disclosed ODRC value as at the relevant balance date is consistent with its current pricing arrangements (which involve treating the revaluation gains from CPI-indexation as income), as well as information disclosure. As such, that RAB value should be consistent with the expectations of both MDL and its consumers. Although the link between asset values and prices is not as strong in the case of GasNet, the Commission sees no grounds in s 52A terms for departing from the 2009 disclosure values.
- F5.37 For its gas distribution and transmission assets not subject to the Gas Authorisation, Vector's ODV valuations are older, given that it has updated its valuations on an historic cost basis in more recent years. Vector has expressed concerns about using the disclosure valuations for its NGC Transmission and Distribution assets as the basis for regulation under Part 4. It has made a number of representations about its minimum expectations that the Commission would undertake a new ODV valuation once price-quality regulation was formally introduced for GPBs, although it has acknowledged that any regulatory "compact for GPBs was less clear than for EDBs".
- F5.38 In particular, Vector refers to the Commission's 2005/06 decisions on a new ODV valuation methodology during consultation on the Gas Authorisation (paragraph F5.20) as 'final', and its expectation that this valuation methodology would be used for valuing Vector's gas pipeline assets.⁷⁸⁰ Vector has, however, also acknowledged that the Commission has consistently indicated that revaluation gains should be treated as income.⁷⁸¹
- F5.39 If the GPBs formed an expectation that the Commission would require a new ODV, for the purposes of price-quality regulation, this expectation could not have survived the Authorisation. In its Decisions Paper on the Authorisation, the Commission comprehensively addressed earlier indications it had given concerning a new ODV, and outlined its reasons for concluding, at the end of the consultation process, that valuations based on Powerco's 2002 ODV and Vector (Auckland)'s 2003 ODV would be carried forward. These valuations were updated for subsequent capital additions/disposals and depreciation to 2005 without indexation, and then subject to CPI-indexation from 2005 onward. The difference in indexation treatment before and after 2005 was because, subsequent to 2005 (i.e. when the Authorisation took effect), the Commission could ensure that revaluation gains from CPI-indexation were appropriately treated as income under the Authorisation's price-quality path.
- F5.40 The initial RAB valuations for Powerco and Vector (Auckland) established as at 30 June 2005 under the existing Gas Authorisation were subject to significant scrutiny during the Authorisation, and an extensive consultation process was followed.⁷⁸² The Commission considers these valuations are still appropriate under the Part 4 regime, after rolling them forward for actual capital additions/disposals, depreciation and CPI-indexation, consistent with the Authorisation terms.

⁷⁸⁰ Vector, *supra* n 774, pp 34-36.

⁷⁸¹ Vector, *Cross-Submission on IM Conference*, 15 October 2009, paragraph 100. Vector has also argued that smoothing the price shock impact of any revaluation could be achieved in a manner that meets investors' and consumers' reasonable expectations (*ibid.*, paragraph 15).

⁷⁸² Powerco challenged the Commission's approach to establishing the initial RAB under the Gas Authorisation in the High Court, but discontinued its challenge the week before the hearing date.

- F5.41 Vector's NGC Distribution and NGC Transmission assets were not, however, subject to the Authorisation. The Commission notes that there might have been an expectation that, if and when the NGC assets were subject to price-quality regulation, those assets might have been indexed post-2005 in the same manner as the Vector (Auckland) assets. The Commission does not, however, consider that this necessarily follows, given that revaluation gains from CPI-indexation have been appropriately offset under the Authorisation, whereas that is not necessarily the case for the Vector NGC assets. On the other hand, the Commission notes that, under the asset valuation IM, all other GPBs are implicitly permitted some level of indexation since 2005. Consequently, although not necessary for consistency with the Part 4 Purpose, the Commission considers it is reasonable for Vector to index the value of its NGC Distribution and Transmission assets since 2005, consistent with the Authorisation's approach to valuing Vector (Auckland)'s assets since 30 June 2005.
- F5.42 The Commission has also considered whether any additional adjustments might be warranted, such as to make the Vector NGC valuations more consistent with the methodology used to value the Powerco and Vector (Auckland) assets, or to allow comparable adjustments to those that the Commission has permitted for EDBs (e.g. updating for assets that were excluded by the optimisation and EV tests, where relevant). As noted above, such adjustments are not necessary for consistency with the Part 4 Purpose. In addition, EMCa's consistency review concluded that all available ODV/ODRC valuations would require some adjustments to be consistent with MED's 2000 draft ODV Handbook. In the case of NGC Distribution and NGC Transmission, the net effect was a significant downward revaluation.⁷⁸³ Consequently, refraining from revisiting the value of the Vector NGC Distribution and Transmission assets to address issues of consistency with Vector (Auckland) is likely to be conservative in Vector's favour.

⁷⁸³ EMCa, supra n 763, p. 4.

APPENDIX G: COMPONENTS AND APPLICATION OF THE TREATMENT OF TAXATION IM

G1 Introduction

G1.1 This appendix is split into two sections. The first outlines the key components of the IM for the treatment of taxation; the second deals with the way in which the IM for the treatment of taxation will apply to the applicable types of regulation.

G2 Components of the Methodology

List of components

G2.1 The key components of the decisions relating to the treatment of taxation are:

- deductions for regulatory tax purposes;
- the treatment of tax losses in the wider tax group;
- the tax treatment of acquisitions;
- establishing the initial regulatory tax asset value; and
- establishing the initial deferred tax balance.

Deductions for regulatory tax purposes

Approach

G2.2 When calculating regulatory taxable income, the cost allocation IM and tax legislation (to the extent practicable) are to be used, subject to other relevant provisions in the IMs. Debt interest should be calculated using a notional leverage that is consistent with the cost of capital IM, and a deduction in respect of the term credit spread differential under the cost of capital IM should also be made (but is optional under information disclosure for exempt EDBs).

Reasons

G2.3 As noted at the outset of Chapter 5, an issue for regulators lies in identifying the proportion of the annual tax liability that is attributable to the provision of regulated services. Under Part 4, this can be difficult because a number of suppliers provide a number of services that are not regulated under Part 4. To address this complicating factor, an estimate of tax costs can be derived by applying tax legislation to the regulatory accounts of the regulated part of the business, to the extent practicable, and subject to other relevant provisions in the IMs (i.e. the IMs have precedence). The regulatory accounts, and the revenue and expenses used to derive regulatory net income, are found by applying the cost allocation IM to the operating costs and asset values associated with the supply of a particular type of regulated service.

G2.4 Given that the allocation of debt costs is not covered by the cost allocation IM, a similar decision is also required on the way in which, and thus how much, debt

interest should be allocated to a particular type of regulated service when making an assessment of regulatory net income. This is because debt is typically issued on a consolidated (i.e. whole group) basis. A simple way to address this allocation problem is to also use a proxy deduction for interest—found by multiplying the interest rate on debt capital by a ‘benchmark’ leverage ratio and by the value of the RAB.

- G2.5 It is appropriate that the level of debt attributed to the regulated part of the business be consistent with the level of leverage used in calculating the WACC. This ensures that the treatment is consistent with two main ways in which the WACC can potentially be calculated: a ‘vanilla’ WACC, and a ‘post-tax’ WACC.
- G2.6 When the Commission’s estimates the cost of capital facing a regulated supplier, a notional rather than actual level of leverage will be used (for the reasons given in Chapter 6 and Appendix H on the cost of capital). Since tax costs facing each regulated supplier are estimated in a way that recognises that they realise tax benefits through leverage (i.e. by estimating the ‘levered tax liability’, which is an estimate of tax costs after the tax deduction for interest is taken into account), each regulated supplier’s rate of return would need to be compared to a cost of capital that is free of any tax adjustments to the cost of debt. The resultant WACC is consequently known colloquially (in New Zealand) as a ‘vanilla WACC’ (i.e. a weighted combination of the pre-tax cost of debt and the post-tax cost of equity).⁷⁸⁴
- G2.7 Typically, however, interested persons in New Zealand are likely to be more familiar with a post-tax WACC than a vanilla WACC. In the post-tax formulation of the WACC, the tax deduction for interest is already included in the WACC formula. To avoid double-counting of the tax deduction for interest, this amount (i.e. the interest tax shield) must be added to the levered tax liability where a ROI value is being compared to the post-tax WACC. To ensure comparability, the leverage assumption in this interest tax shield calculation must match the leverage assumption in the post-tax WACC calculation.
- G2.8 In addition, given it relates to debt interest costs, a deduction in respect of the term credit spread differential under the cost of capital IM (refer Chapter 6) should also be made (but is optional under information disclosure for exempt EDBs).

Treatment of tax losses in the wider tax group

Approach

- G2.9 Tax losses in a regulated supplier’s wider tax group should be ignored when estimating tax costs. Any tax losses generated in the supply of a particular type of regulated service should be notionally carried forward to the following time period.

Reasons

- G2.10 Ignoring tax losses in the wider tax group prevents the attribution of tax benefits to a regulated part of the tax group when they have already been attributed and used up by another regulated part of the wider tax group. Under the modified deferred tax

⁷⁸⁴ The Commission notes that one option would be to assess regulatory returns on a pre-tax basis (i.e. by including the estimate of tax costs in the cost of capital). However, the Commission considers it is more transparent to separate out these two types of cost (i.e. by treating tax as a separate Building Block).

approach applying to all EDBs and GDBs, there is a low likelihood of tax losses arising in the regulatory tax allowance from the current year's results (as these are determined on a tax expense basis).

- G2.11 There is not a clear cut case for requiring regulated suppliers to share with consumers the benefits that can be achieved by utilising tax losses in the wider tax group. In particular, it is not obvious that an issue of allocative or dynamic efficiency is at stake. No regulated suppliers argued in favour of the recognition of tax losses in the wider tax group.
- G2.12 It is important that tax benefits are not allocated to more than one business unit, as this could potentially disadvantage suppliers of multiple services regulated under Part 4. It is therefore appropriate to recognise this possibility by ignoring the position of the wider tax group.⁷⁸⁵

Tax treatment of acquisitions

Approach

- G2.13 Like the RAB value, the regulatory tax asset value of acquired assets should remain unchanged in the event of an acquisition of assets used to supply services under Part 4 (i.e. from another supplier of services regulated under Part 4). This means that under the tax payable and modified deferred tax approaches the regulatory tax asset value would not be adjusted to reflect the transaction price, and is therefore different to how the tax asset value would be recognised under tax rules in most cases.⁷⁸⁶
- G2.14 To preserve the relationship between the RAB value, the regulatory tax asset value, and the deferred tax balance, and so ensure the existing NPV-equivalence under the modified deferred tax approach for EDBs and GDBs, the deferred tax balance should reflect the tax effects of any adjustments up to the date of sale, and at that point in time transfer undisturbed from the seller to the acquirer.
- G2.15 The balance of unamortised initial differences in asset values in the accounts of the seller will also be the basis of calculating the amortisation of initial differences in asset values over the remaining average useful life in the accounts of the acquirer, subject to any change in the calculation of the average remaining useful life of the assets as a result of only some of the assets that were subject to the amortisation in the accounts of the seller being sold.
- G2.16 Similarly, only that part of the deferred tax balance relating to the sold assets will be transferred to the acquirer.
- G2.17 Annual depreciation temporary differences for the acquirer from the date of sale will be calculated, as they were for the seller, from the difference between tax depreciation and notional regulatory depreciation, which excludes cumulative revaluations from the date at which the initial RAB value is determined.

⁷⁸⁵ For the avoidance of doubt, this is equivalent to saying that subvention payments must be ignored when calculating tax costs facing regulated suppliers.

⁷⁸⁶ This is consistent with the tax treatment that has been employed by the ESC when regulating electricity distribution services in Victoria, Australia. See: ESC, *Electricity distribution price review 2006-10, Final decision Volume 1, Statement of purpose and reasons*, October 2005, pp. 331-332, and 398-399.

G2.18 The amortisation of revaluations for the acquirer in the disclosure year in which the sale occurred will be derived from the unamortised balance of revaluations for the sold assets at the date of sale and the corresponding weighted average remaining life of the regulatory asset base at that time.

Reasons

G2.19 Although this departs from the approach under tax legislation, the merits of this approach are that:

- suppliers retain the net tax benefits of the transaction, but also bear any subsequent costs (i.e. should the IRD revisit the tax consequences of the transaction);
- excessive profits and incentives to pay a significant premium over RAB are still limited by ignoring any acquisition premium (i.e. post-sale RAB is still equal to pre-sale RAB); and
- incentives are retained to make efficiency gains to cover any acquisition premium over RAB, and these efficiency gains would still be shared with consumers over time.

G2.20 An alternative approach would be to set the regulatory tax asset value to the acquisition cost of the assets, consistent with recognition under tax rules in most cases. This would, however, require providing the regulated supplier that purchases the assets with an NPV-adjustment to the RAB value to compensate the buyer for any premia they paid as a result of the tax depreciation claw-back consequences of the acquisition. Regulated suppliers were generally not supportive of these alternative options compared to the approach outlined above.

G2.21 The alternative options were rejected on the basis that they would not be consistent with suppliers retaining the same amount of the net tax benefits of an acquisition (where such benefits arise). This may have the effect of not promoting some efficiency enhancing trades as effectively as the approach preferred by the Commission, and would therefore be less consistent with s 52A(1)(a).

G2.22 Almost all submitters agree with the acceptance of earlier industry submissions that the regulatory tax asset value should not change as the result of an acquisition (i.e. just as the acquisition would not affect the RAB value of the acquired assets, the tax effects of the acquisition would likewise be ignored). A number of submitters noted that the Commission also needs to specify what should happen in respect of the regulatory deferred tax balance, and the Commission has now done so.

G2.23 PwC (for ENA) submits that the approach should be the same as the tax treatment of the difference between the initial RAB value and initial regulatory tax asset value, namely that the regulatory deferred tax balance of the acquired assets should be set to zero, and the difference between the RAB value and regulatory tax asset value of those assets be amortised.⁷⁸⁷ Vector has, however, changed its previous position,

⁷⁸⁷ Electricity Networks Association, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers,

now submitting that the regulatory tax asset value of the acquired assets should change as the result of an acquisition, and be set to the RAB value of those assets. Vector notes that leaving the regulatory tax asset value unchanged is inconsistent with tax legislation, and submits that its approach “significantly simplifies the deferred tax methodology.”⁷⁸⁸ No other submitters commented on Vector’s proposal, however.

- G2.24 Vector’s proposal is indeed simpler. Despite the potential merits of this alternative approach in terms of simplicity, however, it also appears to be less advantageous to regulated suppliers in the event of an acquisition than the approach preferred by the Commission. This alternative approach has therefore been rejected on the basis that it might promote fewer efficiency enhancing trades, which would be less consistent with s 52A(1)(a).⁷⁸⁹

Establishing the initial regulatory tax asset value

Approach

- G2.25 The initial regulatory tax asset value should equal the lesser of the value recognised under tax rules for the relevant assets or share of assets used to supply the regulated services, and the initial RAB value.

Reasons

- G2.26 The establishment of the initial regulatory tax asset value is comparable to the establishment of the initial RAB value. Both decisions have an effect on the profits that will be earned in future on investments made in the past.
- G2.27 Changes in initial regulatory tax asset values have similar effects to changes in regulatory asset values. In the case of the regulatory tax asset value, however, lower valuations are more beneficial to suppliers. This is because a lower valuation implies that deductions for tax depreciation will be lower in future, and would therefore result in a higher estimate of a supplier’s tax obligations. Suppliers would need additional cash flow to meet these notional tax obligations.
- G2.28 The size of the effect of a change in the tax asset value (on prices) is smaller than the effect caused by a change in RAB values. The reason for this is that the effect of a change in regulatory tax asset values is affected by the tax rate. A one dollar decrease in the regulatory tax asset value will lower tax depreciation deductions by one dollar in future, meaning that the supplier will be assessed as paying tax on one more dollar of revenue (i.e. the size of the effect is determined by the corporate tax rate).

Commerce Commission *Input Methodologies on Regulatory Tax: prepared for Electricity Networks Association*, 9 August 2010, pp. 5-6.

⁷⁸⁸ Vector Limited, Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, 9 August 2010, pp. 44-45, paragraphs 169-172.

⁷⁸⁹ The Commission also notes that, given Vector’s proposal recognises tax legislation, but effectively ignores transaction prices in excess of the RAB value, it would be more logical to set the regulatory tax asset value to the lesser of the acquisition price and the RAB value. While it is unlikely that the acquisition price will be less than the RAB value, this possibility would need to be recognised.

- G2.29 A potential starting point for establishing the initial regulatory tax asset value is to use the equivalent actual tax book value for the same assets as recognised under tax rules. A number of submitters have argued, however, that the way in which the initial regulatory tax asset value is established should not appear to be inconsistent with the way in which it is rolled forward.⁷⁹⁰ In particular, given the way that the regulatory tax asset value is rolled forward, it would never (in aggregate) exceed the RAB value (in aggregate).
- G2.30 PwC (on behalf of Powerco) noted that one potential “not incorrect” approach would be to cap the initial regulatory tax asset value at the level of RAB value.⁷⁹¹ In the Draft Reasons Paper the Commission agreed with those submitters which argued that there were consistency reasons for capping the initial regulatory tax asset value at the level of the initial RAB value. However, some submitters, including those that consider the approach to be “not incorrect”, have subsequently argued that the approach is undesirable because it would mean that different firms would set different prices on the basis of whether or not a historical transaction had taken place.⁷⁹² In their view, this would be inconsistent with the outcomes produced in workably competitive markets.
- G2.31 The alternatives proposed by a number of submitters, notably Unison and Powerco,⁷⁹³ are generally more complex, and require an unpicking of the tax effects of past transactions.⁷⁹⁴ These alternatives are intended to simulate a world in which these past transactions did not take place. The effect of this would be to establish more favourable initial tax asset values for suppliers that have completed transactions in the recent past compared to those that have not.⁷⁹⁵
- G2.32 None of these adjustments are required in order to promote outcomes consistent with outcomes produced in workably competitive markets. As noted in Chapter 4, when it comes to determining an appropriate level of revenue for investments made in the past, there are a variety of approaches that could be consistent with outcomes produced in workably competitive markets. In addition, allowing increases in

⁷⁹⁰ For example: PwC (on behalf of Powerco), *Workshop on regulatory taxation*, 25 January 2010, p. 3; Unison Networks Limited, *Post-Workshop Submission on Regulatory Tax*, 1 March 2010.

⁷⁹¹ Powerco Limited, *Pre-Workshop Submission on Regulatory Tax*, Attachment: PricewaterhouseCoopers, *Workshop on Regulatory Tax: a report prepared for Powerco Limited*, 25 January 2010, pp. 3-4.

⁷⁹² Refer, for example: Powerco Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: *PricewaterhouseCoopers, Establishing the initial taxation asset base: a report prepared for Powerco Limited*, 9 August 2010; Unison Networks Ltd, *Submission on EDBs Revised Input Methodologies Draft Determination*, 12 November 2010, pp. 1-4; Powerco Limited, *Submission on EDBs and GPBs Revised Input Methodologies Draft Determination*, Attachment: *PwC Report*, 12 November 2010.

⁷⁹³ Refer, for example: Unison Networks Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 7-11.

⁷⁹⁴ The same submitters that urge the Commission to unpick the tax effects of past transactions have also argued that it would be unlawful for the Commission to unpick the effects of past asset revaluations.

⁷⁹⁵ Any regulatory tax asset value that exceeds the actual tax asset value will provide additional cash to the regulated supplier for the remaining lifetime of those assets. Capping the regulatory tax asset value at the RAB value is appropriate going forward, as it may better contribute to efficiency enhancing trades, consistent with s 52A(1)(a). On the other hand, the way that the initial regulatory tax asset value is set is unlikely to have any impact on incentives for efficiency in the future, and attempting to unpick the tax effects of past acquisitions would simply result in a higher level of prices to consumers with no offsetting benefits. No fundamental inconsistency therefore exists between the proposed tax treatment of past and future acquisitions in the Determination. Because the impact of the treatment of past and future acquisitions, in s 52A(1)(a) and (b) terms, is different, the tax treatment may also differ.

regulatory values—and therefore decreases in regulatory tax asset values—will have no effect on a supplier’s incentive to invest further, as was accepted by a number of submitters during consultation.⁷⁹⁶

G2.33 The Commission has nevertheless accepted submissions that downward adjustments to regulatory tax asset values would be appropriate where the initial RAB value is lower than the equivalent actual tax book value for the same assets recognised under tax rules. The Commission’s reasons are simply that this treatment ensures that there is not an obvious difference between the way regulatory tax asset values are established initially with the way that they will be treated during future transactions. Eliminating obvious differences does not require looking at past transactions in detail.

G2.34 Making this change—a change which will be beneficial to suppliers—in no way strengthens the case for further adjustments to regulatory tax asset values. In particular, unpicking the tax effects of past transactions is not required to promote outcomes consistent with outcomes produced in workably competitive markets, nor would it result in enhanced incentives for efficient investment. Downward adjustments to the regulatory tax asset value would therefore have no other effect but to allow suppliers to charge consumers more for the same service. No evidence has been provided to suggest such an increase would be required for regulated suppliers to be able to earn at least a normal rate of return on the original cost of installing assets. In fact, given the actual tax asset value recognised under tax rules will still be higher than the regulatory tax asset value recognised by the Commission, those suppliers will continue to receive a regulated tax allowance greater than their actual tax obligations to the IRD.

G2.35 Relative to the alternatives proposed by submitters, the approach preferred by the Commission better reflects the reality of the costs facing regulated suppliers. It would not be appropriate to take a different approach for individual suppliers. For suppliers to have appropriate incentives to invest, the treatment of past acquisitions need not exactly match the treatment of future acquisitions.

Establishing the initial deferred tax balance under the deferred tax approach applying to EDBs and GDBs

Approach

G2.36 For all regulated suppliers, the initial deferred tax balance should be zero.

Reasons

G2.37 The modified deferred tax approach must be designed in a way that is expected to be NPV-equivalent to the tax payable approach. Apart from other adjustments relating to revaluations, it is therefore appropriate to set the initial deferred tax balance to zero and amortise the difference between the initial RAB value and the initial regulatory tax asset value over the residual lifetime of the assets. This approach was supported by participants at the tax workshop.⁷⁹⁷

⁷⁹⁶ Refer, for example, Comments by Mr. Balchin of PwC (on behalf of Powerco), *Transcript - Input Methodologies Tax Workshop*, 8 February 2010, p. 44, lines 3-12.

⁷⁹⁷ For example: Comments by Mr. Strong (on behalf of Vector), *Transcript - Input Methodologies Tax Workshop*, 8 February 2010, p. 18, lines 26-28.

- G2.38 The alternatives considered by the Commission were to establish the deferred tax balance:
- by solving for NPV-equivalence with a tax payable approach in the absence of any amortisation of differences between the initial RAB value and the initial tax asset value; and
 - by setting the initial deferred tax balance to zero and ignoring any differences between the RAB value and the tax asset value.
- G2.39 A benefit of the first approach is that the deferred tax balance on existing assets would reduce to zero when the assets reach the end of their lives. The Commission has rejected this option, however, because it would result in initial deferred tax balances for each regulated supplier that appear somewhat arbitrary, despite being equivalent to the Commission's preferred approach in NPV terms. The second option was rejected because the approach is not equivalent in NPV-terms to the tax payable approach.

Tax treatment of discretionary discounts and customer rebates for EDBs

Approach

- G2.40 Discretionary discounts and customer rebates made by EDBs should be treated as a tax deductible expense, if allowed under tax legislation, but should not be treated as a cost for the purposes of disclosing or determining regulated revenue.

Reasons

- G2.41 Consumer-owned EDBs commonly provide returns to their consumer owners through a range of mechanisms, including rebates, discounts, and line charge holidays, or through dividends. Variations in the treatment of dividends, rebates, discounts and line charge holidays, including the variation in the treatment of tax on these amounts, can distort the reporting of the ROI.⁷⁹⁸
- G2.42 The reason for this is that not all of the various distribution mechanisms are recognised under tax rules in the same way as tax deductible expenses. Notably, dividends are a post-tax item, not treated as a tax deductible expense. On the other hand, discretionary discounts and customer rebates (as opposed to posted discounts, which are not discretionary once posted) are a pre-tax item that have been recognised under tax rules as a tax deductible expense.
- G2.43 In the current information disclosure requirements for EDBs, for the purposes of determining regulated income, discretionary rebates are treated as being equivalent to dividends. Therefore, regulated revenues are disclosed before the deduction of rebates. On the other hand, where discounts are part of the posted prices, they are deducted from revenues. Rebates are treated as tax deductible, consistent with recognition under tax rules to date.
- G2.44 In its submission prior to the February 2010 Tax Workshop, PwC submitted that, rather than treating dividends and discretionary rebates the same, discretionary

⁷⁹⁸ Refer, for example: Commerce Commission, *Regulation of Electricity Lines Businesses, Information Disclosure Regime, Companion Paper to the Revised Information Disclosure Requirements*, 31 October 2008, paragraphs 110-115.

rebates should be treated in the same way as posted discounts. All discounts would be subject to a notional tax adjustment to align them with dividends or retained earnings. PwC considers that doing so would make the ROIs for EDBs with different types of ownership comparable;⁷⁹⁹ and doing otherwise may mean that if suppliers are subject to the DPP, then they may be faced with a downward adjustment to starting prices on the basis of profits that are not earned.

G2.45 Under either approach, the ROIs will not be strictly comparable due to the different way that the tax treatment of the various approaches is recognised under tax rules. Unlike posted discounts, however, which are not discretionary, discretionary rebates do not have the characteristics of a price, and therefore should not be recognised as a cost that affects regulated revenue. Consumers of trusts which use posted discounts and discretionary discounts receive their rebates in exactly the same way; the only difference being that, in the former case, the amount is published earlier. The EDB can thus decide at the end of its financial year to adjust the level of rebates in a manner that is intended to affect its tax obligations, but consumers are not able to respond to price signals in the same way that they can respond to a discount posted as part of the schedule of line charges.

G2.46 As such, it is appropriate to recognise discretionary discounts and customer rebates as a dividend rather than an expense for the purposes of disclosing or determining regulated revenue. The fact that rebates can be recognised under tax rules as a tax deductible expense should, however, be recognised. This is consistent with ensuring that the regulatory tax allowance is sufficient to compensate EDBs for their actual tax obligations, rather than for notional obligations which assume EDBs face tax costs that they never actually incur and which would not be consistent with s 52A(1)(d).

G2.47 PwC (for 20 EDBs) have also argued that the proposed approach is inconsistent with proposed WACC IM, which assumes that shareholders have access to imputation credits, whereas the proposed IM for the treatment of taxation means that there are no imputation credits on the amount being added back to the surplus.⁸⁰⁰ The Commission has not been convinced by these arguments, because the treatment of company tax and investor tax are distinct issues. Moreover, there are no grounds for different WACC values on the basis of different ownership arrangements. The WACC is intended to apply industry-wide, for the reasons given in Chapter 6.

G3 Application of the Methodology

G3.1 This section provides an overview of how the Commission expects the IM for the treatment of taxation to apply to:

- information disclosure; and
- default/customised price-quality regulation.

⁷⁹⁹ PwC on behalf of 21 Electricity Distribution Businesses, *Pre-Workshop Submission to the Commerce Commission on the Input Methodologies (Electricity Distribution) Emerging Views Paper – Regulatory Tax Workshop, Made on Behalf of 21 Electricity Distribution Businesses*, 26 January 2010, pp. 6-7.

⁸⁰⁰ PwC on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 18-19, paragraph 54.

Application to information disclosure

- G3.2 Pursuant to s 52S, the Commission must apply the IM for the treatment of taxation when setting information disclosure requirements under subpart 4 of Part 4. Both exempt and non-exempt EDBs and GPBs will be required to disclose information in accordance with these requirements.
- G3.3 The purpose of information disclosure is to ensure sufficient information is readily available to interested persons to assess whether the purpose of Part 4 is being met (s 53A).
- G3.4 Among other things, regulated suppliers will be required to disclose their ROI. The ROI is expected to be a key component of information disclosure regulation, as it will inform interested persons' assessment, and the Commission's analysis, of whether regulated suppliers are limited in their ability to extract excessive profits (s 52A(1)(d)).
- G3.5 On an annual basis, and in simplified form, a regulated supplier's ROI can be calculated as follows:

$$\text{ROI} = \frac{\text{Revenue} - \text{Depreciation} - \text{Opex} - \text{Tax} + \text{Revaluations}}{\text{Regulatory Investment Value}}$$

- G3.6 The Regulatory Investment Value will, among other things, comprise the value of the RAB plus, where appropriate, the value of the regulatory deferred tax balance. The inclusion of the regulatory deferred tax balance in the Regulatory Investment Value is required for NPV-equivalence. Where the regulatory deferred tax balance is a liability it will reduce the denominator, thereby increasing the ROI (all other things being equal). The opposite will be the case where there is a deferred tax asset. In the case of GTBs, the regulatory deferred tax balance will always be nil.
- G3.7 Calculated in the appropriate way, the ROI may be compared to a regulated supplier's WACC under Part 4, to assess the regulated supplier's profitability over time.⁸⁰¹ The IM for the treatment of taxation is a key input into the calculation of the ROI measure, as it determines the tax term in the numerator of the equation above and, where a deferred tax approach is applied, also affects the denominator.

Application to default/customised price-quality regulation

- G3.8 A comparison of the WACC and the disclosed ROIs may also inform starting price adjustments for DPPs, as under s 53P(3)(b) starting price adjustments can be based on current and projected profitability. Therefore, given its application in determining disclosed ROIs, the IM for the treatment of taxation may—together with the other applicable IMs—indirectly inform the determination of appropriate DPPs for suppliers.

Treatment of tax in CPP proposals

- G3.9 Suppliers may subsequently choose to propose alternative CPPs that better meet their particular circumstances. Under s 53Q(2)(d), every customised price-quality

⁸⁰¹ Where the ROI is compared with a post-tax WACC, the tax term must include the interest tax shield (paragraph A.27).

proposal must apply or adopt all relevant IMs. This includes the IM for the treatment of taxation.

- G3.10 CPPs will be set based on a building blocks calculation of a regulated supplier's required revenue over the regulatory period. Tax is one of the main building blocks. Regulated suppliers wishing to apply for a CPP will therefore need to provide projections of the regulatory tax allowance and, for all regulated suppliers other than MDL, the regulatory deferred tax balance estimated in accordance with the IM for the treatment of taxation.

APPENDIX H: COST OF CAPITAL

H1 The Framework for Determining the Cost of Capital IM

Overview of the decision-making framework

H1.1 For firms to make investments, they need to raise money ('capital'). There are two generic sources of capital: debt and equity.⁸⁰² In general terms, debt involves the firm promising to make specific payments to the debt provider, which are specified when the debt capital provider first provides the capital. In contrast, the firm in general makes only conditional, if any, promises to make specific payments to providers of equity. Equity providers have a degree of actual or potential control over the firm and expect to obtain a return from the success of the firm. Firms may raise debt capital by, for example, issuing bonds or borrowing from a bank. Firms may raise equity capital by, for example, issuing shares that may be traded on the stock exchange or by retaining earnings. Usually, debt eventually has to be repaid to the provider of debt capital, whereas equity does not have to be repaid to the provider of equity capital. Firms will almost always have some form of equity capital.

Key cost of capital concepts

H1.2 Raising either debt or equity capital involves a cost to the firm. In the case of debt capital, the cost is the return which the investor expects to obtain from the firm. It is a cost because the debt investor will only provide capital if the firm promises to provide this return, including a margin to compensate the investor for the possibility that the firm will not in fact meet its promise.

H1.3 The cost of equity is the return which the equity investor expects to obtain from the firm. In the case of equity, the firm does not promise the return but instead the investor decides what amount of capital they are prepared to provide in return for a share in the firm. Such a share entitles the investor (i.e. shareholder) to a corresponding proportion of dividends and other returns provided to shareholders. Therefore the cost of equity is conceptually the dilution of the existing shareholders' interest that results from raising equity capital, including the dilution (i.e. spreading of the claim to future cash flows over a larger capital investment) implicit in the retention of cash flow or in accounting terms retained earnings. Investors supplying capital will require that the price of the shares issued to them is such that the expected return is equal to the return they would expect to obtain on an alternative investment of equal risk. Their obtaining a share in future cash flows is at the expense of the other shareholders. The cost of capital reflects the cost of debt and the cost of equity, and the respective proportion of each that is used to fund the investment.

H1.4 The cost of equity capital to the firm is not directly observable.⁸⁰³ The cost can however be deduced in a number of ways. As an illustration, one approach to estimating the cost of equity capital is to consider the average returns actually

⁸⁰² There are a variety of forms of both debt and equity capital.

⁸⁰³ The cost of equity, expressed as a rate of return, is the discount rate implicit in the price at which equity can be raised (given the investors' expectations of future cash flows which they will derive or have claim to). This discount rate cannot be directly observed or calculated because the investors' true expectations cannot be directly observed.

obtained by equity investors over a long time period (i.e. many years) and to assume that on average over this long time period the occasions on which the actual return exceeds the equity investors' expectations offset the occasions on which the actual return falls short of the equity investors' expectations. On this assumption the actual average return over the long time period will provide an estimate of equity investors' expected return, and that is the cost of equity capital.

H1.5 The total capital of a firm is the sum of the market value of the firm's debt and the market value of its equity. When the cost of debt capital is weighted by the proportion of debt capital to total capital, and the cost of equity capital is weighted by the proportion of equity capital to total capital the result is the 'Weighted Average Cost of Capital' or, in short, WACC or the 'cost of capital' to the firm. The cost of capital is expressed as a percentage of its total capital, i.e. as a rate of return.

H1.6 The simplest formulation of the cost of capital does not take explicit account of the tax deductibility of interest and is referred to as the 'vanilla' weighted average cost of capital. This is used in applications where the tax deductibility of interest is taken into account in cash flows. The vanilla formula is:

$$\text{Cost of capital} = r_d L + r_e (1-L)$$

where r_d is the cost of debt capital, r_e is the cost of equity capital, and L is the leverage ratio. The leverage ratio is the proportion that debt capital represents of the total capital (total capital is the sum of debt capital plus equity capital).⁸⁰⁴

Guidance from the Act – workably competitive markets

H1.7 As signalled in Chapter 2, the Commission has asked itself what guidance 'promoting outcomes consistent with outcomes produced in workably competitive markets' means for making its decisions on the cost of capital. The Commission has also considered whether, and if so how, each of the regulatory objectives in s 52A(1)(a)-(d) are relevant to the decision on cost of capital, and whether there are any practical constraints on the form of the cost of capital. The Commission has considered the inter-relationship between capital markets (which are highly competitive) where funding is raised, and product/service markets where the capital for the most part funds investment.

H1.8 Analysis of the factors determining firms' cost of capital in workably competitive capital markets suggests that the cost of capital is primarily related to the exposure to risk that cannot be avoided by diversifying i.e. by spreading investment across a variety of firms.⁸⁰⁵ The risk which cannot be reduced by diversification is systematic risk.⁸⁰⁶ This is the exposure to overall market movements i.e. the

⁸⁰⁴ As WACC relates to expected market rates of return, in theory the *market* value of both debt capital and equity capital should be used in the calculation of the leverage ratio. However, in practice, calculating the market value of debt capital is difficult as most corporate debt is rarely traded. Fortunately, in the vast majority of cases in New Zealand the book value of debt capital is a reasonable proxy for the market value of debt capital. With respect to equity capital, the market value of equity capital will be available if the shares of the firm are listed on a stock exchange. If the shares are not listed, only the book value of equity capital will be available.

⁸⁰⁵ See Markowitz, H., Portfolio Selection, *Journal of Finance*, Vol. 7, No. 1, 1952, pp. 77-91; Tobin, J., Liquidity preference as behavior towards risk, *The Review of Economic Studies*, Vol. 25, 1958, pp. 65-86.

⁸⁰⁶ In the context of the cost of capital, it is useful to distinguish between two types of risk, systematic risk and unsystematic risk:

correlation of the movements in the value of the firm or asset to the total value of all assets. Most models of the cost of capital recognise that the higher a firm's level of exposure to systematic risk, the higher its cost of capital. This reflects a risk-reward trade-off, insofar as investing in firms where returns are likely to be more correlated with market returns, (i.e. investments exposed to more risk), will require higher expected returns. Unsystematic risk is not generally rewarded in workably competitive capital markets.⁸⁰⁷

The relationship between firms' returns in workably competitive markets and the cost of capital

- H1.9 The cost of capital is the expected rate of return to be earned in the long-term for investment to occur. The expected rate of return must at least cover the cost of capital in order to attract the required investment funds.
- H1.10 Assuming workably competitive capital markets, investors will be prepared to make capital available for firms to compete in supply of products and services whenever the expected return is at least as high as the cost of capital. In workably competitive product and services markets, firms are able to lower prices and/or improve quality while still meeting the expectations of their capital providers so long as their expected return is at least as high as the cost of capital. Thus if they are able to reduce their costs, there will be a tendency for prices to be reduced and/or quality to be improved until expected returns have fallen to the cost of capital.
- H1.11 Actual returns will deviate from expected returns due to a wide range of unanticipated factors. By definition, the expected overall result of unanticipated factors over an extended period is that they cancel each other out. Thus in a workably competitive product or services market the expectation at any time looking into the future is that the average return over a long time period will tend to the cost of capital. The outturn observed in any particular case looking back into the past may of course differ from this expectation for a wide range of reasons.

Systematic risk reflects the extent to which an asset (or stock) participates in the fluctuations or movements in the overall market. Systematic risk of an asset (or stock) is therefore sometimes described as that component of risk that is 'correlated' with the overall market. Examples of systematic risks are the impact that changes in real GDP, inflation, currency movement, major technological advances and a recession have on the returns earned on an individual asset (or stock). The correlation of the returns on an asset with the value weighted return on all assets in the market is the asset's beta.

Unsystematic risk (or idiosyncratic specific asset risk) is the risk unique to a specific asset (or stock), and this component of the risk of an asset (or stock) is uncorrelated with general movements in the overall market. It includes the risks associated with an asset (or stock) that arise through increasing competition, changes to antitrust legislation, technological innovations, and geographic location. Empirical studies have generally found that the unsystematic or idiosyncratic risk will be eliminated (or diversified out of) through investors holding a sufficiently large portfolio of stocks. The unsystematic risk associated with an asset (or stock) is therefore also referred to as the 'diversifiable risk'. The risk that remains after diversification is the systematic risk, also referred to as the 'non-diversifiable' risk.

⁸⁰⁷ A key analytical basis of the pre-eminent cost of capital model, the CAPM, is that provided capital markets are competitive and efficient, equity investors will only expect to be compensated for bearing systematic risk. Rational investors could and would diversify away firm-specific risk, so such risk should not be priced by the market. (This result would hold to a first approximation provided capital markets are workably competitive.) The implication for regulators is that, when setting allowed rates of return, compensation should only be awarded to investors for bearing systematic risk.

Implications for estimating the cost of capital for EDB/GPB services under Part 4

Cost of capital in the context of regulation

- H1.12 As discussed in Chapter 2 (see, for example, paragraph 2.6.28), the Commission considers that to enable regulated suppliers to raise capital, regulation should provide them with the expectation of earning at least a normal return in the long-term, i.e. they should expect to maintain their efficient financial capital.
- H1.13 That said, when considering the concept of expecting to earn at least a normal rate of return in the long-term, it is important to have regard to two key clarifications. First, under default/customised price-quality regulation, the Commission is only seeking to align revenues to achieving at least normal returns in the long-term on an *ex ante* basis. Indeed, as noted in Chapter 2, incentive-based regulation might be expected, in principle, to result in *ex post* returns somewhat in excess of the cost of capital, as firms achieve efficiency savings during the regulatory period. Similarly, in allowing an appropriately risk-adjusted cost of capital, the Commission is allowing regulated firms to earn sufficient remuneration to compensate for risks associated with the adverse effects on the industry concerned of economic fluctuation that may arise in a particular regulatory control period. As such, any attempt to align returns to the cost of capital on an *ex post* basis could undermine the key incentive effects of the regulatory framework.
- H1.14 Second, as outlined in greater detail below, due to the uncertainty and standard errors associated with the key parameters used in the estimation of the cost of capital, the Commission will identify a cost of capital range. If the Commission chooses a point estimate above the mid-point of the range, the overall return may reflect an allowance somewhat in excess of an expectation of a normal rate of return on an *ex ante* basis.
- H1.15 In workably competitive markets, risks are allocated to the parties best able to bear them. As discussed above, an accurate estimate of firms' cost of capital needs to reflect their level of systematic risk exposure.
- H1.16 In workably competitive markets where there are sunk costs and long-lived specialised infrastructure investments, suppliers can reduce the risk of not recovering their costs, through long-term contracting. Long-term contracts can potentially increase the likelihood of the supplier earning the required return on investment, while also protecting consumers from the exercise of market power after the contract is competitively awarded. Such contracts can reduce the supplier's exposure to systematic risk (i.e. correlation of returns to market returns).
- H1.17 In markets where there is no or limited competition, suppliers have exclusive or almost exclusive dealings with customers as there are no or limited competitors for consumers to switch to. In the case of monopoly suppliers of regulated services, regulation ensures that these suppliers can expect to earn at least a normal return on their assets. This provides for a similar relationship to a long-term contract in a workably competitive market, although there may be an even stronger expectation of cost recovery for an essential facility monopoly supplier.
- H1.18 In particular, for a monopoly supplier of regulated services there is likely to be an expectation of less variation in profitability as a result of any shock to the

economy,⁸⁰⁸ as unlike a workably competitive market supplier, there is almost guaranteed demand for the service and little likelihood of any effective competition in the future. Therefore, there will potentially be lower risks associated with profitability and cost recovery than would arise in a workably competitive market with long-term contracts in place.

- H1.19 For this reason the cost of capital in regulated services around the world is often observed to be lower than that of unregulated companies in competitive markets. However, there may also be some variability in the cost of capital amongst regulated services on the basis of the type of regulatory regime implemented.⁸⁰⁹
- H1.20 For example, where the period between regulatory reviews is longer (e.g. price-cap regulation for a five-year period), regulated suppliers will potentially be exposed to greater variation in their expected returns compared with those regimes where more frequent regulatory reviews can occur and any costs are directly passed through (e.g. traditional US-style rate-of-return regulation). All other things being equal, in these circumstances, price-cap regulation with less frequent regulatory reviews, will lead to a higher cost of capital. In this case the benefits of less frequent regulatory reviews in encouraging improvement in efficiency is being valued as offsetting the higher cost of capital from the consumers perspective.

Cost of capital under Part 4

- H1.21 Under Part 4, the Commission has set an IM for the estimation of the cost of capital for the purposes of monitoring and analysing information disclosed by the EDBs and GPBs. The Commission will also use these estimates for the purposes of price setting (through default and customised price-quality paths). The Commission has considered a range of analyses used by capital market practitioners to estimate the cost of capital. The Commission has also considered academic analyses of the factors relevant to the choice of which forms of analysis and corresponding models are appropriate for the purposes of Part 4. In reviewing these analyses, the Commission is mindful that the purpose of Part 4 is to promote the long term benefit of consumers by promoting outcomes consistent with those in workably competitive markets. The Commission notes that the models used by it are based on capital markets being workably competitive and are used by firms, and advisers to firms, in workably competitive markets. The Commission's choice of cost of capital model has been informed by advice from its Expert Panel⁸¹⁰ and the submissions received during the Commission's consultation on the cost of capital. The Commission has tested the results of its IM to ensure they are commercially realistic in light of the information on the expected returns on investments of comparable risk, and ensure that suppliers of regulated services have an incentive to innovate and invest.

⁸⁰⁸ There is an argument that once it is known that a firm will be regulated, investors will expect that the beta of the firm to be lower than if it were not regulated. Regulation ensures that the firm cannot fully exploit its market power which in turn means that less of its customers are facing the point at which they would reduce their demand i.e. in practice give up their connection to the grid. The Commission's estimates of beta are based on a sample of comparative firms that includes regulated firms and so incorporate the effects of regulation.

⁸⁰⁹ Alexander, I., Mayer, C. and Weeds, H., Regulatory structure and risk: an international comparison, Policy research working paper 1698, *The World Bank*, December 1996, and Alexander, I., Estache, A., and Oliveri, A., A few things transport regulators should know about risk and the cost of capital, *Utilities Policy*, 9, 2000, pp. 1-13.

⁸¹⁰ Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, Report prepared for the Commerce Commission, 18 December 2008, p. 6.

- H1.22 In the context of default/customised price-quality regulation, the Commission uses the estimated cost of capital to determine the expected normal rate of return in the long-term for a regulated service. The expectation of a normal rate of return ensures there are incentives to invest as the returns offered from investing in the regulated service is similar to that offered by alternative investments of similar risk. In the context of information disclosure, the Commission uses its cost of capital estimates to provide a guide for normal returns that will assist interested parties in assessing if excessive returns are being earned and thereby assist in determining whether the purpose of Part 4 of the Act is being met.
- H1.23 The regulatory challenge for the Commission is to determine an estimate of the cost of capital for the provision of regulated services that is consistent with the cost of capital faced by suppliers⁸¹¹ in workably competitive markets, i.e. neither too high, nor too low, such that the objectives in s 52A(1)(a) to (d) are achieved.
- H1.24 In the context of monitoring, if the cost of capital is set too low it might incorrectly suggest that a supplier of regulated services was not limited in its ability to extract excessive profits. If the supplier were to reduce prices as a response to such an incorrect indication of excessive profitability, this might prevent the supplier from attracting sufficient capital to undertake efficient investment. This would be inconsistent with s 52A(1)(a) of the Act. Equally, a cost of capital that is set too high would mask the regulated supplier's ability to extract excessive profits over the medium or long-term.⁸¹² This would be inconsistent with s 52A(1)(d) of the Act.
- H1.25 In the context of price control, if the cost of capital is set too low, regulated suppliers might have insufficient incentives to innovate and invest and might be unable to attract sufficient capital to undertake efficient investment, which would be inconsistent with s 52A(1)(a) of the Act. If the regulator sets the allowed rate of return too high, i.e. inappropriately above the rate of return of an investment of equal risk suppliers ability to extract excessive profits will not be limited, which would be inconsistent with s 52A(1)(d) of the Act.

Estimating the cost of capital

- H1.26 The methodology for setting the cost of capital must ensure that the expected returns from investing in regulated services are similar to other investments of comparable risk, so regulated suppliers have incentives to innovate, invest and improve, and are limited in their ability to extract excessive profits.
- H1.27 While neither the cost of debt nor the cost of equity are directly observable, the former can be more readily estimated than the latter. This is because the estimation of the cost of debt requires fewer assumptions and approximations than the estimation of the cost of equity. In addition, a number of models exist for estimating the cost of equity. The Commission must identify what it considers to be the most appropriate model to use.

⁸¹¹ The cost of capital faced by suppliers in workably competitive markets is determined in the capital market which may be closer to a perfectly competitive market.

⁸¹² The Commission notes that, in the short-term, suppliers of regulated services may achieve above-normal profits if they outperform the objectives set by the regulator.

- H1.28 Further, there are a number of parameters associated with the cost of debt and cost of equity that need assigned values when estimating the cost of capital. Some of these parameter estimates have measurement errors associated with them, i.e. there is uncertainty as to how well the estimated value represents the parameter's unobservable 'true' value.
- H1.29 In estimating the cost of capital, the Commission recognises that this is an estimation process, which is likely to be imprecise. The aim of the Commission therefore is to estimate a cost of capital that, when applied under Part 4, promotes outcomes as regards to quality and pricing of the regulated services that are consistent with those produced in workably competitive markets.
- H1.30 In regards to information disclosure, due to the imprecision of the cost of capital estimation, the Commission will estimate a range for the cost of capital. The Commission considers it may be preferable, in the context of setting price-quality paths for EDBs, GPBs, and Transpower, to err on the side of setting a rate that is likely to be favourable for the regulated supplier. That is, if a point estimate is required for these industries, a figure above the mid-point of the range may be used.
- H1.31 The reason for the Commission adopting a cost of capital estimate that is above the mid-point for default/customised price-quality regulation, is that it considers the social costs associated with underestimation of the cost of capital in a regulatory setting involving constraining pricing to end users (as opposed to information disclosure applications and situations involving competition among suppliers), are likely to outweigh the short-term costs of overestimation (i.e. if the cost of capital is set too low, the incentives for suppliers to undertake efficient investments will be reduced, which would be inconsistent with the long-term benefit of consumers). That is, the Commission is acknowledging that where there is potentially a trade-off between dynamic efficiency (i.e. incentives to invest) and static allocative efficiency (i.e. higher short-term pricing), the Commission will always favour outcomes that promote dynamic efficiency. The reason is that dynamic efficiency promotes investment over time and ensures the longer term supply of the service, which thereby promotes the long-term benefit of consumers (consistent with outcomes in workably competitive markets).

Cost of capital across different types of regulated services

- H1.32 When estimating the cost of capital for suppliers in a workably competitive market, a number of the parameter estimates, such as the risk-free rate and the tax-adjusted market risk premium, will be common across services regulated under Part 4 of the Act. To the extent that there are differences between the cost of capital estimates across services, sectors, or industries in workably competitive markets, this should reflect differences in the level of systematic risk that they face. Parameters that may differ across services, reflecting variability of returns or risk include the measure of systematic risk in the cost of equity (i.e. the beta estimates) and estimates of the debt premium.

H1.33 Therefore, cost of capital estimates across different types of regulated services, such as those provided by Airports, EDBs, GPBs and Transpower, reflect differences in the risk profiles associated with the supply of these services.⁸¹³

H2 Overall Approach

The appropriate cost of capital framework

H2.1 The IM for the cost of capital framework requires that a vanilla cost of capital and post-tax cost of capital will be estimated for EDBs and GPBs for the purpose of information disclosure. For the purposes of default/customised price-quality regulation, the IM requires the Commission to apply a vanilla cost of capital only.

H2.2 The vanilla cost of capital will be determined as the expected cost of equity capital and the expected cost of debt capital, weighted by the respective proportion each represents of the total capital. The post-tax cost of capital will be determined as the expected cost of equity capital and the after tax expected cost of debt capital, weighted by the respective proportion each represents of the total capital. These are given by the following formulae:

$$\text{vanilla cost of capital} = r_d L + r_e (1-L)$$

$$\text{post-tax cost of capital} = r_d (1-T_c) L + r_e (1-L)$$

where r_d is the cost of debt capital, r_e is the cost of equity capital, T_c is the corporate tax rate, and L is the leverage ratio. The leverage ratio is the proportion that debt capital represents of the total capital (total capital is the sum of debt capital plus equity capital).

H2.3 The framework for the cost of capital IM includes that:

- a vanilla WACC and post-tax WACC will be estimated for EDBs and GPBs for the purpose of information disclosure, and a vanilla WACC will be estimated for the purposes of default/customised price-quality regulation;
- the estimate of the expected cost of debt capital will be calculated as the risk-free rate plus the debt premium;
- debt issuance costs will be added on to the cost of debt;
- the estimate of the expected cost of equity capital is to be derived by using the simplified Brennan-Lally version of the CAPM;
- reasonableness testing against other versions of the CAPM will not be specified as part of the IM. However, the Commission has tested the estimates

⁸¹³ Further, where estimates for different regulatory instruments are taken at different times and over different periods (e.g. the CPP can apply for either a three, four or five year period), the estimates of the cost of capital will differ. This is consistent with the outcomes expected in workably competitive market where the cost of capital is estimated at different times and for different periods.

of the cost of capital using the IM, against estimates using the classical CAPM, and a range of other information;⁸¹⁴

- a service-specific, rather than supplier-specific, cost of capital will be estimated for electricity distribution services (i.e. the same cost of capital will apply to all EDBs);
- a service-specific, rather than supplier-specific, cost of capital will be estimated for gas pipeline services (i.e. the same cost of capital will apply to all GPBs); and
- no adjustments will be made to the cost of capital for unsystematic or asymmetric risk, including real options.

Commission's reasons for the form of the WACC

- H2.4 The WACC can be calculated on a vanilla or post-tax basis. In the case of a vanilla WACC, the corporate tax shield provided by debt capital is ignored in the WACC estimation, and firms are remunerated for their levered tax liabilities through a cash flow allowance. In the case of a post-tax cost of capital, the cost of debt is adjusted down by an interest tax deduction, and the company is remunerated for its unlevered tax liabilities through a cash flow allowance (i.e. the 'interest tax shield' is included).
- H2.5 Submitters did not state any clear preference in terms of how suppliers should be remunerated for tax liabilities but stressed the need for consistency between the Commission's approach with regard to regulatory tax and the cost of capital.
- H2.6 The IM's approach with regard to tax is consistent with the use of a vanilla WACC.⁸¹⁵ However, the Commission does acknowledge that a post-tax WACC is more readily understood by interested parties. Ensuring the WACC is understood by interested parties is particularly important in the context of information disclosure and to promote certainty.
- H2.7 For these reasons, the IM requires estimation of both a post-tax and vanilla WACC for the purposes of information disclosure. The ID Determinations for EDBs and GPBs would need to include an adjustment to the interest tax shield (i.e. the notional deductible interest in the IM multiplied by the corporate tax rate) to ensure consistency with any post-tax WACC estimated in accordance with the IM. For the purposes of default/customised price-quality regulation, the IM estimates only the vanilla WACC.⁸¹⁶

⁸¹⁴ This is discussed in section H13 Reasonableness checks on the cost of capital.

⁸¹⁵ Commerce Commission, *IM Discussion Paper*, 19 June 2009, paragraph 8.29.

⁸¹⁶ Use of a vanilla cost of capital is consistent with including tax as a separate building block, where the tax benefits associated with leverage are incorporated in the tax building block and not in the cost of capital. Including the tax benefits in the building blocks more accurately reflects the supplier's tax liabilities to the IRD. It therefore represents a more transparent approach.

Commission's reasons - estimating the cost of debt

Cost of debt

H2.8 The cost of debt (r_d) is the expected overall cost to the firm of borrowing. The standard practice in analysis of the cost of debt is to decompose the cost of debt into the two components. The two components are: the risk-free, the rate at which a debt issuer that was certain to meet its debt obligations would be able to borrow (for example, New Zealand dollar obligations of the New Zealand government), and the debt premium. The debt premium compensates the investor for the risk that the issuer in question may default, plus an allowance for the inferior liquidity of corporate bonds relative to government bonds.

H2.9 Firms incur fees and other costs when they raise debt capital. These costs are referred to as debt issuance costs. The IM recognises that fees and costs associated with prudent debt issuance and refinancing are legitimate expenses that are to be compensated.

H2.10 Thus, the cost of debt will be equal as follows:

$$\text{Cost of debt} = \text{risk-free rate} + \text{debt premium} + \text{debt issuance costs allowance}$$

H2.11 Debt issuance costs can be accounted for either in the cash flows or as an addition to the cost of debt capital. The IM compensates firms for debt issuance costs in the form of a fixed addition to the cost of debt, rather than an allowance in cash flows, as it provides a greater degree of certainty to firms. It also promotes a greater degree of comparability across suppliers.

H2.12 The Commission's approach to estimating the risk-free rate, the debt premium and debt issuance costs are discussed sections H4 and H5 of this appendix respectively.

H2.13 The additional debt premium that firms incur on issuing long term debt is discussed in section H6. The approach to estimating debt betas is discussed in section H9.

Commission's reasons - estimating the cost of equity

Cost of equity - appropriate model for estimating the cost of equity

Overview

H2.14 The cost of equity is the expected rate of return required by investors on equity capital that compensates them for the risk they bear and the time value of money, and the opportunities they forgo by committing funds to the firm. The cost of equity cannot be observed directly; it must be estimated.

H2.15 One of the most common economic models used to estimate the cost of equity is the CAPM (referred to as the classical CAPM), which was originally developed by Sharpe, Lintner and Mossin.⁸¹⁷ The Commission considers that there are two main alternative asset pricing models to the CAPM: the Fama-French three-factor

⁸¹⁷ See Sharpe, W., Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk, *Journal of Finance*, Vol. 19, No. 3, 1964, pp. 425–442; Lintner, J., The Valuation of Risky Assets and the Selection of Investments in Stock Portfolios and Capital Budgets, *Review of Economics and Statistics*, 47, 1965, pp. 13–37 and Mossin, J., Equilibrium in a Capital Asset Market, *Econometrica*, Vol. 34, No. 4, 1966, pp. 768–783.

model;⁸¹⁸ and the group of models usually described as discounted cash flow (DCF) models. These models are discussed below.

The capital asset pricing model (CAPM)

- H2.16 The CAPM is a single factor model that postulates a positive linear relationship between the expected return on an asset and the systematic risk associated with holding that asset. For a discussion of systematic (and unsystematic risk), please refer to paragraph H1.8.
- H2.17 Under the assumptions on which the CAPM is based the cost of equity is decomposed into two components - the risk free rate plus the risk premium applicable to an individual stock. The risk premium is directly proportional to that stock's exposure to systematic risk, i.e. its beta.
- H2.18 The CAPM is appealing because it identifies a single measure of risk and it is well-understood by analysts and commentators. The CAPM has received support from many regulators and academics as a reasonable model for estimating the regulated cost of capital.⁸¹⁹
- H2.19 Like all economic models, the CAPM has its limitations. For example, it contains a number of simplifying assumptions which may not hold in practice such as that there are no restrictions on short-selling, markets are frictionless, and investors may borrow or lend unlimited amounts at the risk-free rate.⁸²⁰ Further, in some studies the actual returns of low-beta stocks appear to be higher than the CAPM's predictions, and the returns of high-beta stocks appear to be lower. A number of other economic factors have been shown to explain historical average returns better than the CAPM's beta in specific cases.⁸²¹
- H2.20 There are, however, a range of possible explanations for the results recorded in such empirical tests. For example, the results may reflect the serious methodological problems that exist in undertaking a robust test of the CAPM, including the difficulty of correctly observing the market portfolio.
- H2.21 In their classic finance textbook, Copeland, Weston & Shastri note that there are many alternative explanations for the CAPM's performance in empirical tests and that a great deal of energy has been devoted to the empirical tests on how well the CAPM model fits the data.⁸²² They conclude, that "researchers have been working

⁸¹⁸ Fama, E. F., French, K. R., Common Risk Factors in the Returns on Stocks and Bonds, *Journal of Financial Economics*, Vol. 33, No. 1, 1993, pp. 3–56.

⁸¹⁹ See Myers, S. C., The Application of Finance Theory to Public Utility Rate Cases, *Bell Journal of Economics and Management Science*, Vol. 3, 1972, pp. 58–97 and Myers, S. C., On the Use of β in Regulatory Proceedings: A Comment, *Bell Journal of Economics and Management Science*, Vol. 3, 1972, pp. 622–627. Wright, S., Mason, R., Miles, D., *A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K.*, a Smithers & Co. Ltd. report to the OFT and U.K. economic regulators, 2003. IPART, IPART's weighted average cost of capital, Research - Final Decision, p. 2 and p. 13.

⁸²⁰ Copeland, T., Weston, J., and Shastri K., *Financial Theory and Corporate Policy* 4th Edition, Pearson Education, 2005, chapter 6.

⁸²¹ See Grinblatt, M., Titman, S., *Financial Markets and Corporate Strategy*, 2nd edition, McGraw-Hill: New York, 2002, Section 5.40; and for surveys of the empirical evidence on the CAPM see Campbell, J. Y., Lo, A. W., MacKinlay, A. C., *The Econometrics of Financial Markets*, Princeton: New Jersey, 1997, pp. 211-217 and Jagannathan, R., Meier, I., Do We Need CAPM for Capital Budgeting?, *Financial Management*, Vol. 31, 2002, pp. 55–77.

⁸²² Copeland, T., Weston, J., and Shastri K., *Financial Theory and Corporate Policy* 4th Edition, Pearson Education, 2005.

on tests of the CAPM for nearly 40 years, and no conclusive evidence has been published to date – the jury is still out”.⁸²³

- H2.22 An example of the methodological problems in robustly testing the CAPM is provided by Pettengill, Sundaram & Mathur (Pettengill et al.).⁸²⁴ Pettengill et al. note that CAPM posits a positive relationship between beta and expected returns, but the relationship is conditional on the market excess returns when realised returns are used. That is, when the market excess returns are positive (negative), the relationship between returns and beta would be positive (negative). In other words, low beta stocks earn lower returns during up markets, but higher returns during down markets. Pettengill et al. argue that many prior empirical tests of the CAPM are biased against the CAPM as they fail to adjust for the conditional relationship between actual returns and beta. Adjusting for this bias, Pettengill et al. find a strong positive relationship between beta and returns. Their work spawned a significant number of subsequent studies the results of which were also more supportive of the CAPM than previous studies, and in particular that there was a strong relationship between beta and returns.
- H2.23 Professor Myers observes that the CAPM’s beta sometimes suffers from estimation errors so large that it can be difficult to draw any reliable conclusions; that the instability of beta over time can be problematic; and that the model does not seem to provide a comprehensive explanation of the risk-return relationship on either a theoretical or empirical level.⁸²⁵ However, in his advice to the Commission, Professor Myers still recommends the use of the CAPM framework to estimate the cost of capital as it provides valuable insights.⁸²⁶

Alternative asset pricing models

- H2.24 The Fama-French three-factor model adds two factors to the CAPM’s market factor (‘MRP’). These factors are a firm size factor (the return on small-firm stocks minus the return on large-firm stocks) and a book-to-market factor (the return on high book-to-market ratio stocks minus the return on low book-to-market ratio stocks). Each factor may represent a risk premium that contributes towards the overall risk premium of the asset.
- H2.25 Fama and French assert that their simple three-factor model explains most of the risk premiums of stocks (the so-called anomalies of the CAPM) identified by these competing models.⁸²⁷ However, the theoretical foundations of the Fama-French factors are less well-developed than that of the CAPM, and Fama and French have been criticised for ‘data mining’ — inferring the existence of relationships in the

⁸²³ *ibid*, p.164.

⁸²⁴ G. Pettengill, S Sundaram, & I. Mathur, The Conditional Relation between Beta and Returns, *Journal of Financial and Quantitative Analysis*, Vol. 30, No, 1 Mar 1995, pp. 101-116.

⁸²⁵ Myers, S. C., On the Use of β in Regulatory Proceedings: A Comment, *Bell Journal of Economics and Management Science*, Vol. 3, 1972, pp. 622–627.

⁸²⁶ Franks, J., Lally, M. and Myers, S., *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, Report prepared for the Commerce Commission, 18 December 2008, pp. 9-11.

⁸²⁷ Fama, E. F., French, K. R., Multifactor Explanations of Asset Pricing Anomalies, *Journal of Finance*, Vol. 51, 1996, pp. 55–84.

data that appear purely through chance.⁸²⁸ Wright, Mason and Miles (Wright et al.) observe that the statistical significance of the factors themselves is dubious; there is little evidence that the historical risk premiums associated with these factors are significantly different from zero.⁸²⁹ Furthermore, the reliability of the model may vary between countries; the model has typically been applied to US or UK data.

H2.26 A specific application of the Fama-French model was considered in detail by the AER in the Jemena Gas decision.⁸³⁰ The AER concluded that:

- The Fama-French three-factor model was not well accepted by academics, financial market practitioners, nor regulators;⁸³¹
- The Fama-French three-factor model is empirically driven, without a strong theoretical grounding;⁸³²
- The estimates produced by the Fama-French three-factor model “are not arrived at on a reasonable basis”;⁸³³ and
- The Fama-French three-factor model “does not produce a better estimate or forecast than the CAPM of the cost of equity”.⁸³⁴

H2.27 Finally, the availability of reliable size and book-to-market data may constrain the model’s applicability to some New Zealand industries. Hence, the Fama-French three-factor model suffers from its own limitations.

DCF Models

H2.28 There are several forms of DCF models. The simplest of these is Gordon’s constant dividend growth model, which says that the cost of equity capital on an equity security is the discount rate that equates the current stock price to the present value of the future stream of expected dividends, which are expected to grow in perpetuity at a constant rate.⁸³⁵

H2.29 DCF is routinely applied by US regulators, such as the Federal Energy Regulatory Commission (‘FERC’), as the primary model for estimating firms’ allowed return on equity.⁸³⁶

H2.30 There are a number of limitations with the DCF models:

⁸²⁸ For examples see Campbell, J., Why Long Horizons? A Study of Power Against Persistent Alternatives, *Journal of Empirical Finance*, Vol. 8, 2001, pp. 459–491 and MacKinlay, A. C., Multifactor Models do not Explain Deviations from the CAPM, *Journal of Financial Economics*, Vol. 38, 1995, pp. 3–28.

⁸²⁹ Wright, S., Mason, R., Miles, D., *A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K.*, a Smith & Co. Ltd. report to the OFT and U.K. economic regulators, 2003, pp. 72-76.

⁸³⁰ AER, *Jemena Gas Networks, Access arrangement proposal for the NSW gas markets Final decision, 1 July 2010- 30 June 2015*, pp. 108-172.

⁸³¹ *ibid*, pp. 108-172, pp. 119-134

⁸³² *ibid*, pp.108-172, pp. 134-138.

⁸³³ *ibid*, pp. 108-172, p. 142.

⁸³⁴ *ibid*, pp. 108-172, p. 148.

⁸³⁵ Gordon, M., *The Investment, Financing, and Valuation of the Corporation*, Irwin: Homewood, 1962.

⁸³⁶ Gordon, K., Makhholm, J. D., *Allowed Return on Equity in Canada and the United States: An Economic, Financial and Institutional Analysis*, NERA report, 2008.

- First, the informational requirements mean the standard model is only feasible for listed firms that pay dividends;
- Second, the constant growth assumption is only reasonable for stable, mature firms;
- Third, good forecasts of dividend growth are essential. In practice, forecasts of firms' earnings are used as a surrogate for the growth in dividends, so it is necessary to assume that earnings and dividends grow roughly in balance. It is also necessary to assume that forecasts do not systematically underestimate or overestimate earnings, and that growth forecasts are based on the same information that the market uses to value firms' stocks.⁸³⁷ Presently, forecasts of earnings for some, but not many, New Zealand firms are available through the Institutional Brokers' Estimate System (IBES);
- Fourth, dividend growth forecasts, which are generally only available for the short-run, often exceed the long-run rate of economic growth. Cornell observes that, as a consequence of this empirical fact, and the constant growth model's assumption that the forecast growth rate applies in perpetuity, gives rise to the implausible result that the company will eventually engulf the entire economy.⁸³⁸ Multistage models described in the Expert Panel report and by Cornell, seek to overcome this problem,⁸³⁹ and
- Finally, the model relies on the assumption that financial markets are efficient and correctly value investments.⁸⁴⁰ The empirical evidence on that question has been mixed, at best.

H2.31 There are many other asset pricing models apart from the three discussed here. Wright et al. survey several of these, including nonlinear, conditional, multifactor and intertemporal models. They conclude that each suffers from its own shortcomings, and in their view, "there is no one clear successor to the CAPM for practical cost of capital estimation".⁸⁴¹

Estimating the cost of equity in practice

H2.32 The CAPM remains the most widely applied asset pricing model by both regulators and financial practitioners in New Zealand and throughout the world. In its previous regulatory decisions, the Commission has consistently applied a CAPM framework. All Australian regulators use the CAPM approach to estimate the cost of equity, it has been used also in the UK and Europe, while DCF has been applied by some US regulators (and CAPM is used as a cross-check in some instances).

⁸³⁷ See Grinblatt, M., Titman, S., *Financial Markets and Corporate Strategy*, 2nd edition, McGraw-Hill: New York, 2002, pp. 388-390.

⁸³⁸ Cornell, B., *The Equity Risk Premium: the Long-run Future of the Stock Market*, Wiley: New York, 1999.

⁸³⁹ Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, Report prepared for the Commerce Commission, 18 December 2008; Cornell, B., *The Equity Risk Premium: the Long-run Future of the Stock Market*, Wiley: New York, 1999, Chapter 3.

⁸⁴⁰ Independent Regulators Group (IRG), *Regulatory Accounting — Principles of Implementation and Best Practice for WACC Calculation*, February, 2007, p. 19.

⁸⁴¹ Wright, S., Mason, R., Miles, D., *A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K.*, a Smithers & Co. Ltd. report to the OFT and U.K. economic regulators, 2003, Chapter 3, p. 76.

- H2.33 In the New Zealand context, the Commission has considered the regulatory cost of capital for the Telecommunication Service Obligation ('TSO') net cost calculations determination,⁸⁴² the Airports Inquiry,⁸⁴³ in the Gas Control Inquiry,⁸⁴⁴ the Electricity Inquiry into Unison,⁸⁴⁵ and the Gas Authorisation.⁸⁴⁶ In these decisions, the Commission has consistently applied a CAPM framework.
- H2.34 The use of the CAPM was considered and accepted by the New Zealand High Court in the Auckland Bulk Gas Users case.⁸⁴⁷ In its judgment in that case the High Court described the CAPM as "a sensible theory, logically rigorous and consistent with accepted and acceptable economic thinking". The court stated that the CAPM:

...is a simple concept, fundamental to financial theory, providing a positive relationship between the perceived or estimated risk and the required rate of return. We believe it is a satisfactory model and an appropriate method to calculate the capital cost for pricing purposes. We think that the Commission was entitled to make use of that methodology to the exclusion of other particular formulas in making its pricing decision.⁸⁴⁸

Challenges to regulators' use of the CAPM

- H2.35 Over the years, many regulators have been challenged on their reliance on CAPM through submissions. In doing so, many submitters rely on the empirical literature to justify adoption of a different method of estimating the cost of equity, notwithstanding that there is no conclusive evidence or consensus on how to interpret the empirical tests or what a better method may be.
- H2.36 The issue was considered in detail by Wright, Mason and Miles (Wright et al.)⁸⁴⁹ for the U.K. economic regulators⁸⁵⁰ and the Office of Fair Trading. Wright et al. concluded that:⁸⁵¹

[t]he Capital Asset Pricing Model (CAPM) is (still) widely-used to estimate firms' costs of capital. There is considerable evidence of empirical shortcomings in the CAPM; but its clear theoretical foundations and simplicity contribute to its popularity.

- H2.37 After reviewing some of the empirical research developments, Wright et al note:⁸⁵²

⁸⁴² Commerce Commission, Determination for TSO Instrument for Local Residential Service for period between 20 December 2001 and 30 June 2002, 17 December 2003, and every year with the latest being the Commerce Commission, Draft TSO Cost Calculation Determination for TSO Instrument for Local Residential Telephone Service for period between 1 July 2008 and 30 June 2009, 4 December 2009.

⁸⁴³ Commerce Commission, *Final report Part IV Inquiry into Airfield Activities at Auckland, Wellington and Christchurch International Airports*, 1 August 2002.

⁸⁴⁴ Commerce Commission, *Gas Control Inquiry*, Final Report, 29 November 2004 (Commerce Commission, Gas Control Inquiry).

⁸⁴⁵ Commerce Commission, *Electricity Distribution - Regulation of Electricity Lines Businesses Targeted Control Regime Intention to Declare Control Unison Networks Limited*, September 2005.

⁸⁴⁶ Commerce Commission, Gas Authorisation Decisions Paper, 30 October 2008.

⁸⁴⁷ *Auckland Bulk Gas Users v Commerce Commission* [1990] 1 NZLR 448, pp. 466-467.

⁸⁴⁸ *Auckland Bulk Gas Users v Commerce Commission* [1990] 1 NZLR 448, 467.

⁸⁴⁹ Wright, S., Mason, R., Miles, D., *A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K.*, a Smithers & Co. Ltd. report to the OFT and U.K. economic regulators, 2003, pp. 72-76; Smithers & Co. Ltd, *A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the UK*, Feb 13, 2003.

⁸⁵⁰ The U.K. economic regulators are The Civil Aviation Authority (CAA), Office of Water Services (OFWAT), Office of Gas and Electricity Markets (Ofgem), Office of Telecommunications (Ofcom), Office of the Rail Regulator (ORR) and Office for the Regulation of Electricity and Gas (OFREG).

⁸⁵¹ Wright, S., Mason, R., Miles, D., *A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K.*, a Smithers & Co. Ltd. report to the OFT and U.K. economic regulators, 2003, p. 75-76.

In summary: the empirical shortcomings of the CAPM are known. Alternative models to address this issue have their own shortcomings - weak theoretical foundations and empirical challenges. In our view, there is no one clear successor to the CAPM for practical cost of capital estimation.

H2.38 The issue has also been addressed by a number of Australian regulators, including the AER (2009 and 2010⁸⁵³), the QCA (2004) and most recently by IPART (Nov 2009, final Apr 2010⁸⁵⁴). All have continued to use the CAPM to estimate the cost of equity.

H2.39 Notwithstanding the criticisms levelled at the model and its imperfections, for the following reasons, the Commission retains the CAPM:

- it enjoys almost universal use and acceptance by New Zealand companies, practitioners and analysts;
- it has been used consistently by regulators in New Zealand, Australia, the UK and Europe;
- there is no consensus as to what model is better than the CAPM;
- no other model enjoys even a fraction of the support in practice that the CAPM enjoys;
- there is still extensive ongoing debate about the theoretical basis of the other models, and there are difficulties in sourcing reliable data for these other models;
- the use of CAPM was upheld by the High Court in New Zealand;⁸⁵⁵ and
- the Commission's Cost of Capital Expert Panel also considered how best to estimate the cost of equity. All members of the panel recommended the use of the CAPM (in one form or another).⁸⁵⁶

Submissions on use of the CAPM

H2.40 In submissions on the Revised Draft Cost of Capital Guidelines (RDG)⁸⁵⁷ and IM Discussion Paper⁸⁵⁸ interested parties highlighted the CAPM's poor performance in under (over) estimating the cost of equity for low (high) beta firms.⁸⁵⁹ LECG for

⁸⁵² *ibid*, p. 76.

⁸⁵³ AER, *Electricity Transmission and Distribution Network Service Providers - Review of the Weighted Average Cost of Capital (WACC) Parameters, Final Decision*, May 2009. AER, *Jemena Gas Networks, Access arrangement proposal for the NSW gas markets Final decision, 1 July 2010- 30 June 2015*, pp.108-172.

⁸⁵⁴ IPART, *Alternative approaches to the determinations of the cost of equity – other industries discussion paper*, November 2009, p. 18. IPART, *IPART's weighted average cost of capital, Research - Final Decision*, p. 2 and p. 13.

⁸⁵⁵ *Auckland Bulk Gas Users v Commerce Commission* [1990] 1 NZLR 448, pp. 466-467.

⁸⁵⁶ Professor Myers recommended the classical CAPM, Associate Professor Lally recommended the simplified Brennan-Lally CAPM, while Professor Franks recommended the use of both of these models and the International CAPM.

⁸⁵⁷ Commerce Commission *Revised Draft Guidelines - The Commerce Commission's Approach to Estimating the Cost of Capital*, 19 June 2009 (RDG).

⁸⁵⁸ Commerce Commission, *IM Discussion Paper*, 19 June 2009.

⁸⁵⁹ See for an example PricewaterhouseCoopers, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009.

ENA cited evidence indicating that, when applied to New Zealand capital market data, the CAPM has been unable to detect any relationship between excess returns and beta. LECG also cited evidence that for New Zealand electricity lines and gas pipeline businesses the precision of CAPM-based cost of capital estimates were low.⁸⁶⁰

H2.41 PwC (for 17 EDBs) submitted that:⁸⁶¹

We acknowledge the practical difficulty in being able to estimate the parameters required by other models such as the International CAPM, the Dividend Discount (or DCF) model and the Fama-French three factor model. We therefore consider that the Classical and Brennan-Lally CAPMs are the most practical to apply in New Zealand at this time.

H2.42 During further consultation on the appropriate cost of capital for the IM the majority of the suppliers and users of regulated services recommended that for IMs the Commission should use a CAPM framework, instead of other estimation models (i.e. dividend discount model, Fama-French model), to estimate the cost of equity.

Conclusion - appropriate model for estimating the cost of equity

H2.43 The CAPM is the most widely understood and most widely used method for estimating the cost of equity in New Zealand, and by regulators in Australia, the UK, and Europe. Whilst alternative models exist, they are rarely used in practice (including in a regulatory context) and have their own shortcomings, including an extensive ongoing debate about their theoretical basis, and the difficulties in sourcing reliable data required by the other models. Due to its strong theoretical foundations, its simplicity and its greater acceptance, the CAPM is preferred by the Commission.

Cost of Equity - The form of the CAPM

Overview

H2.44 Since its initial development a number of variations of the CAPM model have been developed which incorporate different assumptions relating to the taxation of returns from debt and equity. The classical CAPM effectively assumes that personal taxes do not differ across forms of income, and as a result, these tax rates drop out of the model. It therefore does not adjust for the effect of any imputation credits attached to dividends, or reflect differences in tax rates in capital gains relative to dividends. It is therefore inconsistent with the New Zealand tax regime that permits the use of imputation credits to offset investor tax obligations in order to avoid double taxation (i.e. on company earnings, and then again on personal earnings), and generally imposes no capital gains tax.

H2.45 The 'Brennan-Lally CAPM' (and the simplified version of it) is an alternative to the classical CAPM that explicitly takes account of differing tax rates on different forms of income. Lally, and Cliffe and Marsden modified Brennan's model to adapt it to

⁸⁶⁰ LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report for ENA, 11 August 2009, p. 10 (LECG for ENA, Comments on estimating the Cost of Capital).

⁸⁶¹ PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, Report on Behalf of 17 EDBs, 2 December 2009, p. 7.

the New Zealand tax regime. The simplified version of the model considers only the effects of dividend imputation and assumes that capital gains are tax free.⁸⁶²

H2.46 The formula to calculate the cost of equity using the simplified Brennan-Lally CAPM is:

$$r_e = r_f(1-t_i) + \beta_e \text{TAMRP}$$

where r_f is the risk-free rate, t_i is the investor tax rate on interest, β_e is the equity beta and TAMRP is the tax adjusted market risk premium.

H2.47 In Australia, the Officer Model was developed in relation to the Australian taxation system. A different CAPM variant, the International CAPM takes into account international investors.

H2.48 However, none of these models fully reflect market circumstances. In particular, the classical CAPM and simplified Brennan-Lally CAPM, and to some extent the Officer model, assume national capital markets are closed. The international CAPM assumes that capital markets are integrated but this model has difficulties in its application.⁸⁶³

H2.49 In practice, New Zealand capital markets are partially integrated in the sense that overseas investors play a large role. One implication of the presence of international investors is that not all imputation credits can be fully utilised since non-New Zealand taxpayers cannot obtain the full benefits of imputation.

H2.50 In this regard, Unison submitted that:⁸⁶⁴

... the Commission should recognise that only a portion of investors in New Zealand's capital markets are able to utilise dividend imputation credits, i.e. rather than assuming 100% of investors are able to utilise imputation credits, the Commission should use an estimate of the actual proportion.

H2.51 The Commission notes that there are two alternatives to the classical CAPM and simplified Brennan Lally CAPM that attempt to take account of the partial integration of New Zealand with international markets. These alternatives are (i) the Officer model,⁸⁶⁵ and (ii) the full (or not simplified) Brennan-Lally CAPM. The Officer model assumes interest and capital gains are subject to the same rate of tax and recognises that imputation credits may not be valued by all investors (such as international investors). The value placed on imputation credits by investors on average is known as the "gamma" parameter in the cost of capital calculation. The

⁸⁶² Lally, M., The CAPM under Dividend Imputation, *Pacific Accounting Review*, 4, 1992, pp. 31–44; Cliffe, C., and A. Marsden, The Effect of Dividend Imputation on Company Financing Decisions and the Cost of Capital in New Zealand, *Pacific Accounting Review*, 4, 1992, pp. 1–30; Brennan, M., Taxes, Market Valuation and Corporate Financial Policy, *National Tax Journal*, 23, 1970, pp. 417–27.

⁸⁶³ The Commission considers that the data requirements of the International CAPM (especially the requirement of a market risk premium that is suitable for more than one country) are too substantial for this model to be considered for practical use.

⁸⁶⁴ Unison, Appendix: Submission on Revised Draft Guidelines: The Commerce Commission's Approach to Estimating the Cost of Capital, 14 August 2009, p. 5 (Unison, Submission on Revised Draft Guidelines).

⁸⁶⁵ Officer, R. R., The cost of capital of a company under an imputation tax system, *Accounting & Finance*, Vol. 34, 1994, pp. 1-17.

main difference between the full and simplified version of the Brennan-Lally CAPM is that the former allows for differences in tax rates on interest, dividends and capital gains and for partial use of imputation credits.

- H2.52 The Officer version of the CAPM model is widely used by regulators and finance practitioners in Australia.⁸⁶⁶ Due to this widespread adoption of the Officer framework over the past decade there have been numerous papers estimating the average utilisation rates of imputation credits in Australia. Despite the availability of estimates and data in Australia, there has still been considerable debate about the value of the gamma parameter that should be use in regulatory proceedings there.⁸⁶⁷
- H2.53 In New Zealand, the same body of literature in relation to the utilisation rate of imputation credits does not appear to exist. In particular, the Commission is not aware of any up-to-date estimates of the utilisation rates of imputation credits for New Zealand. This in part seems to be due to the paucity of data that exists in New Zealand. Instead, applications of the Brennan-Lally CAPM in the New Zealand context typically use the simplified Brennan-Lally CAPM, rather than the Officer or the extended Brennan Lally CAPM to estimate the cost of capital.
- H2.54 A number of submissions highlighted that some international investors, in particular, cannot utilise the imputation credits distributed with dividends.⁸⁶⁸ Therefore, the assumption in the simplified Brennan-Lally CAPM that imputation credits would be fully used is inappropriate. Those submissions contend that use of the simplified-Brennan-Lally CAPM may therefore understate the cost of equity.
- H2.55 The Commission accepts that international investors are substantial investors in New Zealand, and with New Zealand's limited level of domestic savings, international investors are arguably the marginal investors. However, the position of international investors should not be looked at on a piecemeal basis as the differences between international investors and domestic investors is not limited just to the value placed on imputation credits. Rather, international investors face different risk-free rates, different market portfolios, and different views on risk (beta) as well as different tax considerations. A full consideration of these differences would require the use of an

⁸⁶⁶ For example, the Australian Energy Regulator (AER), the Australian Competition and Consumer Commission (ACCC), Independent Pricing and Regulatory Tribunal of New South Wales (IPART) and Queensland Competition Authority (QCA). See Handley, J.C., *Further comments on the valuation of imputation credits, report prepared for the AER*, Final, 15 April 2009, p. 6. Also see Lally, M., Regulatory revenues and the choice of the CAPM: Australia versus New Zealand, *Australian Journal of Management*, Vol. 31, No. 2, December 2006, pp. 313-332, who compares the Officer version of the CAPM against the simplified Brennan-Lally CAPM and the standard Sharpe-Lintner-Mossin CAPM. Lally finds that which of the three models performs best depends on the utilisation rate of imputation credits.

⁸⁶⁷ See AER, *Final decision: Electricity transmission and distribution network service providers – Review of the weighted average coat of capital (WACC) parameters*, May 2009, pp. 393-469 (AER, Final Decision on WACC for Electricity); and Handley, J. C., *Further comments on the valuation of imputation credits*, Report prepared for the AER, 15 April 2009.

⁸⁶⁸ Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, 13 August 2010, pp. 29-30; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 30-32; Orion New Zealand Ltd, *Cross Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper*, Attachment: NERA, *The Cost of Equity: a report prepared for Orion New Zealand Ltd*, 2 September 2010, pp. 7-9.

international CAPM, reflecting estimates of the particular parameters that relate to international investors.

- H2.56 This matter was discussed by the Expert Panel Report.⁸⁶⁹ The advice from Dr Lally is that an international CAPM would tend to provide lower estimates of the cost of equity, than either the simplified Brennan-Lally CAPM or the classical CAPM. Professor Myers did not agree that use of the international CAPM would necessarily yield lower estimates than the simplified Brennan-Lally CAPM.⁸⁷⁰ In support of Dr Lally's conclusion the Commission notes that there are a number of papers which conclude that the estimated cost of capital from an international perspective is lower than the estimated cost of capital from the perspective of domestic investors. These are noted in paragraphs 6.4.33 to 6.4.35.
- H2.57 The Commission notes that some investors in EDBs and GPBs may not be able to use imputation credits fully either, for example, certain types of trusts. However the Commission considers that the ownership structure of regulated suppliers should not affect the choice of the framework used to estimate the cost of capital as the impact of ownership structure should fall on the owners not on consumers. That the impact of the ownership structure for certain firms would alter prices in the market, is inconsistent with outcomes in workably competitive markets.
- H2.58 The only aspect that is relevant is the overall integration of the New Zealand market as a whole not whether individual entities choose to only access the lowest cost of capital structure available given the New Zealand markets' extent of integration. Furthermore, adopting different cost of capital assumptions based solely on ownership structure where there are a number of regulated service providers (particularly where the difference reflects public or private ownership) could potentially create perverse investment incentives. As a result, the Commission considers that it should adopt a single model, which focuses on domestic investors, when estimating suppliers' cost of equity. Given the body of research suggesting that international estimates of the cost of capital are lower than those from a purely domestic perspective, the adoption of a domestic CAPM (simplified Brennan-Lally CAPM) is more likely to advantage regulated suppliers than to disadvantage them.

Form of CAPM used in practice

- H2.59 All Australian regulators currently use the Officer CAPM framework for estimating the cost of equity capital.⁸⁷¹ UK regulators typically use the classical CAPM framework as, in part, it is consistent with the UK tax regime.⁸⁷² Professor Franks in the Cost of Capital Expert Report notes that the UK had a partial imputation system

⁸⁶⁹ Franks, J., Lally, M., Myers, S., *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, 18 Dec 2008, pp. 10-11.

⁸⁷⁰ *ibid.*

⁸⁷¹ Similar to the simplified Brennan-Lally CAPM the Officer model explicitly takes account of imputation credits, but by contrast, assumes that capital gains are taxed at the same rate as interest in Australia. For example, see cost of capital decisions by the AER, ACCC, IPART and QCA.

⁸⁷² Office of the Gas and Electricity Markets (Ofgem), Water Services Regulation Authority (Ofwat), Office of Communications (Ofcom), UK Competition Commission, Civil Aviation Authority (CAA) and Office of Rail Regulation (ORR) all use the classical CAPM framework.

in the late 1980s and early 1990s “... and most parties used a Brennan-Lally-type model.”⁸⁷³

- H2.60 Both the Australian and UK regulators have recently reviewed the use of the CAPM framework against alternative models but have decided not to depart from it as their principal tool to estimate suppliers’ cost of equity.
- H2.61 In its decisions in estimating the cost of equity capital, the Commission has consistently used the simplified Brennan-Lally CAPM⁸⁷⁴ over the classical and Officer model. This has been done on the basis that this version of the CAPM better accounts for the investor tax regime operating in New Zealand than the classical CAPM (which does not allow for imputation credits) and the Officer model (which assumes interest and capital gains are equally taxed).⁸⁷⁵ In the RDG and IM Discussion Paper, the Commission proposed continuing to use the simplified Brennan-Lally CAPM.
- H2.62 At the Cost of Capital Workshop, participants from the suppliers of regulated services indicated that they use the simplified Brennan-Lally CAPM to calculate the cost of capital.⁸⁷⁶

Submissions on the form of the CAPM

- H2.63 In a post-workshop submission Vector noted that “[h]istorically the Commission has adopted the simplified Brennan-Lally CAPM. It was evident from the conference that there was little dispute that this is an acceptable approach to use”. In that submission Vector also submitted that there was no “persuasive evidence” to depart from the use of the simplified Brennan-Lally CAPM and that the Commission should not depart from it unless there was persuasive evidence to do so.⁸⁷⁷
- H2.64 In submissions on the Draft Reasons paper, however, Vector submitted that it is not clear that the simplified Brennan-Lally CAPM is the strongest candidate method for estimating the cost of capital. Vector suggested further data and studies are required, and the Commission should review its choice of model within 18 months of the publication of the IMs.⁸⁷⁸ However, the Commission considers a decision to undertake such a review would be inconsistent with the statutory purpose of input methodologies which is to “promote certainty for suppliers and consumers in relation to the rules, requirements and processes applying to regulation of services under this part”.⁸⁷⁹ However, if a substantially improved model was to be

⁸⁷³ Franks, J., Lally, M., Myers, S., *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, 18 Dec 2008, paragraph 31.

⁸⁷⁴ The simplified Brennan-Lally CAPM has been used in cost of capital estimations by the Commission since 2002 (Commerce Commission, *Part IV Inquiry into Airfield Activities at Auckland, Wellington and Christchurch International Airports, Final report*, 1 August 2002).

⁸⁷⁵ Sharpe, W., *Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk*, *Journal of Finance*, 19, 1964, pp. 425-42; Linter, J., *The Valuation of Risky Assets and the Selection of Investments in Stock Portfolios and Capital Budgets*, *Review of Economics and Statistics*, 47, 1965, pp. 13-37.

⁸⁷⁶ Commerce Commission, *Cost of Capital Workshop Transcript*, 12-13 November 2009, pp. 38-40.

⁸⁷⁷ Vector, *Cross Submission to Commerce Commission on the Weighted Average Cost of Capital Workshop*, 2 December 2009, pp. 7-8.

⁸⁷⁸ Vector, *Submission in response to the Commerce Commission’s Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Of Capital*, 13 August 2010, paragraph 120.

⁸⁷⁹ Section 52R of the Act.

developed, and/or there was a significant change in the models used in practice in New Zealand to estimate the cost of capital, the Commission would need to consider whether the cost of capital IM would need to be amended. The Commission notes that Vector's most recent submission did not explain the apparent change in Vector's position on the suitability of the simplified Brennan-Lally CAPM, nor whether the model or models Vector itself uses have changed.

- H2.65 ENA and LECG (for ENA) "... support[s] the model applied by the Commission, viz, the post-tax form of the CAPM" (that is, the simplified Brennan-Lally CAPM) noting that "... the post-tax form of the model attempts to address New Zealand's imputation tax structure."⁸⁸⁰ Uniservices (for NZAA) agreed that the simplified Brennan-Lally version of the CAPM is an acceptable model for New Zealand under the assumptions of the dividend imputation tax regime.⁸⁸¹
- H2.66 Some submitters considered the Commission should use a number of approaches and models, rather than just the simplified Brennan-Lally CAPM. NERA for Orion⁸⁸² submitted that no single method of estimating the cost of equity should be relied upon exclusively, and that the Commission should inform itself of estimates from other models.⁸⁸³
- H2.67 LECG did not support that approach. LECG's view was that:⁸⁸⁴

... use of different models raises the question of how the different results obtained should be combined – a question that is unlikely to have a simple answer. Therefore, I agree with the Commission in continuing to follow the advice of its long standing expert adviser, Associate Professor Lally, to use only the post-tax form of the CAPM as the model for estimation of the cost of equity.

Leverage

- H2.68 One of the shortcomings that the Commission is concerned about when estimating the cost of capital using the simplified Brennan-Lally CAPM to calculate the equity component of WACC is the relationship of the cost of capital with leverage, i.e. the proportion of debt capital relative to total (i.e. debt and equity) capital. It is normal to regard the use of leverage as a discretionary capital structure decision which

⁸⁸⁰ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, p. 1; Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: LECG, *Response to Commerce Commission's Draft Cost of Capital Input Methodology: a report prepared for the Electricity Networks Association*, 13 August 2010, p. 1.

⁸⁸¹ NZ Airports Association, *Submission on Draft Information Disclosure Determination and Draft Reasons Paper*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper - Report for NZAA*, 12 July 2010, p. 21.

⁸⁸² Orion New Zealand Ltd, *Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, Attachment: NERA, *The Cost of Equity: a report prepared for Orion New Zealand Ltd*, 2 September 2010, p. 3 and p. 23.

⁸⁸³ A similar point was made by Prime Infrastructure (Prime Infrastructure, *Submission on EDBs (Input Methodology) Reasons Paper, Cost of Capital - The Investor Perspective*, 13 August 2010, pp. 7-9) and Telecom (Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010).

⁸⁸⁴ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: LECG, *Response to Commerce Commission's Draft Cost of Capital Input Methodology: a report prepared for the Electricity Networks Association*, 13 August 2010, p. 7.

implies that leverage is increased only where it would reduce or at least not increase the WACC. However, the cost of capital increases with leverage when using the simplified Brennan-Lally CAPM in conjunction with the simplified beta gearing model to calculate the equity component of WACC. If this relationship were true any use of debt would be contrary to the interest of the firm (and thus would not be in the interests of shareholders) and estimation of the cost of capital based on leverage other than zero would be an overestimate of the cost of capital that would correspond to an efficient capital structure.

- H2.69 The Commission has been aware of the counterintuitive relationship between leverage and the cost of capital when applying the simplified Brennan-Lally CAPM in the past. However, it is only since the recent GFC and its associated increase in the debt premium, that this relationship has become so pronounced.
- H2.70 Submitters generally agreed that the observation that New Zealand firms include debt in their capital structures indicates that their Boards and managements do not believe that leverage (at least up to a certain point) increases the cost of capital. One implication of concern to the Commission is that if the simplified Brennan-Lally CAPM were to be applied such that increases in the regulated firm's actual leverage would result in increases in their allowed cost of capital, that would result in an incentive for suppliers of regulated services to increase their leverage. That could well be detrimental to the long-term benefit of consumers to the extent that the risk of default by the supplier was increased with consequent adverse effects on consumers.
- H2.71 The Commission recognises the significance of this aspect of the cost of capital when applying the simplified Brennan-Lally CAPM, and has sought to mitigate the effects thereof, at least to some extent, by adopting a level of notional leverage for each regulated service that reflects the sample of international firms that were analysed to estimate beta for the respective regulated service. This will be discussed in further detail in Section H3 on leverage.

Conclusion - Cost of Equity - The form of the CAPM

- H2.72 The Commission acknowledges that one of the shortcomings of estimating the cost of capital by applying the simplified Brennan-Lally CAPM to calculate the equity component of WACC is its counterintuitive relationship between WACC and leverage that results. The cost of capital increases with leverage when the simplified Brennan-Lally CAPM is used to calculate the equity component of WACC.
- H2.73 Nevertheless, the cost of capital IM uses the simplified Brennan-Lally CAPM to estimate the cost of equity capital. This is for three main reasons:
- First, it takes into account the effect of the New Zealand tax system whereby interest is taxable for investors but (in simplified terms) returns on equity are not double taxed (i.e. dividends are not taxable when received if corporate tax has been paid and no capital gains tax is levied on equity);⁸⁸⁵

⁸⁸⁵ The New Zealand tax regime permits the use of imputation tax credits, attached to dividend payments, to offset the investor's tax obligations. When combined with most investors being exempt from tax on capital gains it results in equity returns being essentially tax free in the hands of the investor whilst interest income is not.

- Second, it has been adopted in previous regulatory determinations by the Commission,⁸⁸⁶ and the New Zealand Treasury has endorsed the use of the simplified Brennan-Lally CAPM for estimating the cost of equity capital for Crown Entities and State-Owned Enterprises;⁸⁸⁷ and
- Third, in New Zealand, the simplified Brennan-Lally CAPM is the most widely used approach to estimate the cost of equity capital - by equity analysts, by suppliers of regulated and unregulated services, and practitioners.⁸⁸⁸

- H2.74 The Commission notes that the full Brennan-Lally and Officer versions of the CAPM could be used to reflect the fact that not all investors are able to access imputation credits. However, the Commission considers that the benefits of using these models are outweighed by the additional level of complication and data requirements they would impose. Further, they are not generally used in New Zealand to estimate the cost of equity capital.
- H2.75 As noted, the Commission recognises the significance of the relationship between the cost of capital and leverage when applying the simplified Brennan-Lally CAPM to estimate the cost of equity. However it considers that the advantages of using this framework outweigh the disadvantages as long as the effects of the counterintuitive relationship between the cost of capital and leverage is mitigated by adopting a level of leverage that is based on the comparative firm sample. This will be discussed in further detail in this paper's section on leverage (Section H3).
- H2.76 A number of participants at the Cost of Capital Workshop, and a number of submitters, proposed that the Commission should consider testing its estimates with the classical CAPM.
- H2.77 The Commission recognises the limitations of the simplified Brennan-Lally CAPM and the merits of using alternative CAPMs to test the results from the simplified Brennan-Lally CAPM. However, formally including a requirement to undertake reasonableness tests in the IM would have created significant subjectivity and uncertainty. For example, the Commission would have to determine (a) the weight that would be accorded to each reasonableness test, (b) criteria outlining when to adjust its cost of equity estimate derived from the simplified Brennan-Lally CAPM in light of the results from the reasonableness tests, and (c) the degree of any resulting adjustment from the reasonableness tests. All three steps would require a significant degree of additional judgement and would have, most likely, to be considered on a case-by-case basis. For these reasons, the Commission considers that formally including reasonableness tests - and any associated adjustment process

⁸⁸⁶ See Commerce Commission, *Gas Control Inquiry, Final Report*, 28 November 2004; Commerce Commission, *Gas Authorisation Decision Paper*, 30 October 2008; Commerce Commission, *Part IV Inquiry into Airfield Activities at Auckland, Wellington and Christchurch International Airports, Final report*, 1 August 2001 and any Commerce Commission TSO Decision Paper.

⁸⁸⁷ New Zealand Treasury, *Estimating the Cost of Capital for Crown Entities and State-Owned Enterprises*, A handbook prepared for the Treasury, 1997.

⁸⁸⁸ At the Cost of Capital Workshop Professor Bowman was the only person not to endorse the use of the simplified Brennan-Lally CAPM. Professor Bowman preferred the use of the Officer framework. PwC NZ publishes a quarterly cost of capital report that uses the Brennan-Lally CAPM. See <http://www.pwc.com/nz/en/cost-of-capital/index.jhtml>.

– in the IM would be inconsistent with the purpose of IMs of providing certainty to suppliers and consumers of regulated services.

H2.78 In reaching its view on the final cost of capital IM, the Commission has tested the estimates of the cost of capital from an application of the IM (using the simplified Brennan-Lally CAPM) against a range of other information including estimates of the cost of capital using the classical CAPM. The purpose of this testing is to ensure that the cost of capital IM produces commercially realistic estimates of the cost of capital that are adequate to ensure continuing investment in regulated services and that suppliers are limited in their ability to extract excessive profits. These tests are further discussed in Section H13.

Ad hoc allowance for model error

H2.79 A number of submissions from suppliers on the draft reasons papers and draft determinations, submitted that the Commission was wrong to rely on the simplified Brennan-Lally CAPM and that the Commission should make an ad hoc allowance for model error.⁸⁸⁹ These submissions argued that an ad hoc allowance should be made to the cost of equity estimated using the simplified Brennan-Lally CAPM (or the cost of capital) to allow for the possibility that the cost of equity on low beta stocks may have been understated. For example:

- CRA (for Unison) argued for a premium for small companies;⁸⁹⁰
- Professor Grundy (for Vector) argued for the use of the Black CAPM;⁸⁹¹
- some submissions argued for more explicit consideration to be given to the cost of equity required by international investors since they are significant investors in New Zealand and unlike most New Zealand investors cannot use imputation credits.⁸⁹²

H2.80 For the reasons sets out in Section 6.4 of this paper, the Commission does not consider ad hoc adjustments for model error are justified generally or in response to the specific examples identified in submissions. Rather than repeat the Commission's analysis in this appendix, the reader is referred back to paragraphs 6.4.20 - 6.4.35.

⁸⁸⁹ See, for example, Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, 13 August 2010, pp. 29-31. Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: LECG, *Response to Commerce Commission's Draft Cost of Capital Input Methodology: a report prepared for the Electricity Networks Association*, 13 August 2010, pp. 11-15. Powerco Limited, *Submission 2 in Response to Draft Input Methodology Decisions and Determination Cost of Capital*, 13 August 2010, pp. 9-11.

⁸⁹⁰ Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Charles River Associates, *Regulated Returns for Australian and New Zealand Electricity Distribution: a report prepared for Unison Networks Limited*, 15 August 2010.

⁸⁹¹ Vector Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper*, Attachment: B. D. Grundy, *The Calculation of the Cost of Capital - A report for Vector*, 13 August 2010.

⁸⁹² Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 30-32.

Commission's reasons – service-specific versus supplier-specific cost of capital

H2.81 If suppliers of a regulated service have similar exposure to systematic risk—that is, if they have similar technology, scale, cost structures, exposure to macroeconomic factors and exposure to regulation—then the Commission should, in principle, apply a ‘benchmark’ or service-specific cost of capital for all suppliers of the regulated service.⁸⁹³ On the other hand, if suppliers have a materially different exposure to systematic risk then the Commission should, in principle, apply a supplier-specific cost of capital for each supplier of the regulated service.

H2.82 Parameters in the cost of capital estimation that could be considered on a supplier-specific basis are (a) leverage, (b) debt premium, and (c) the equity (or asset) beta.⁸⁹⁴ In making its decisions for electricity distribution services and gas pipeline services, the Commission considered each of these parameters individually and concluded that service-specific estimates would be more appropriate for each of them. The reasons for this are discussed in the relevant sections for each parameter.

H3 Leverage

Decision - leverage

H3.1 The IM specifies a service-wide notional leverage of 44% when estimating the cost of capital for EDBs, GPBs and Transpower.

Commission's reasons - leverage

Overview

H3.2 Leverage is the ratio of debt to total capital (i.e. debt plus equity). Leverage is used in the cost of capital estimation in two places: first, in order to calculate the capital structure weights in the cost of capital, and secondly, in the formula transforming asset betas to equity betas (and vice versa).

H3.3 There are three possible approaches to setting the leverage value for a type of service. These are:

- optimal leverage – where the cost of capital for a firm is minimised;
- actual leverage – the ratio of a firm’s actual debt capital to the firm’s actual debt plus equity capital (where market values are used); and
- notional leverage – the level consistent with a hypothetical representative supplier of a regulated service.

Leverage and firms’ cost of capital - theoretical and practical considerations

H3.4 In theory, where there are no taxes and no bankruptcy costs or costs of financial distress apply, the market value of an investment is not affected by the relative proportions of debt and equity capital, i.e. leverage. In other words, leverage does

⁸⁹³ In some sectors, the industry is made up of a single supplier. In such cases, the Commission may draw on evidence of comparable businesses both overseas and in other sectors in New Zealand to establish a suitable benchmark cost of capital for the firm.

⁸⁹⁴ The remaining cost of capital parameters such as the risk-free rate, the tax-adjusted market risk premium, and investor and corporate tax rates apply to all firms in the New Zealand economy equally.

not change the total amount of risk associated with the investment, or the cost of capital. Leverage just reallocates the existing risk between suppliers of debt capital and suppliers of equity capital. The cost of capital would be expected to be invariant to changes in leverage.⁸⁹⁵

- H3.5 With the introduction of corporate taxes, firms can deduct interest on debt capital as an expense for tax purposes ('leverage tax shield'), but cannot deduct dividends on equity capital. Therefore, taking into account corporate taxes but not personal taxes, as leverage increases, the leverage tax shield increases. As a result the cost of capital declines as leverage increases.⁸⁹⁶ Taking account of personal taxes, in New Zealand the effect of dividend imputation and no tax on capital gains redresses the tax advantage of debt described above.⁸⁹⁷
- H3.6 Leverage also possesses a number of qualitative advantages that would be expected to lower the actual cost of capital or to benefit capital providers but cannot be incorporated into models of the cost of capital. These include the signalling value of debt in the presence of asymmetric information,⁸⁹⁸ the reduction of underinvestment problems arising from the use of equity finance,⁸⁹⁹ the reduction of agency costs due to the disciplinary effects of debt,⁹⁰⁰ and the financial flexibility arising from debt.
- H3.7 In practice, businesses would not include debt in their capital structure unless they believed that doing so would lead to the cost of capital remaining unchanged or decreasing, not increasing.

Leverage and the simplified Brennan-Lally CAPM

- H3.8 When debt premiums are particularly high, estimates of WACC that incorporate CAPM estimates for the cost of equity component show WACC as increasing with leverage. This effect is amplified when using the simplified Brennan-Lally CAPM in conjunction with the simplified beta gearing model, as the WACC increases with a positive debt premium when using the simplified Brennan-Lally CAPM and more rapidly than when using the classical CAPM framework. This implies that the cost of capital is minimised when leverage is zero, and thus this would represent the optimal leverage. Using an example with assumed values for a number of parameters,⁹⁰¹ the magnitude of this anomaly in terms of changes in the post-tax

⁸⁹⁵ Modigliani, F., Miller, M. The Cost of Capital, Corporation Finance and the Theory of Investment, *American Economic Review*, Vol. 48, No. 3, 1958, pp. 261–297.

⁸⁹⁶ Modigliani, F., Miller, M., Corporate income taxes and the cost of capital: a correction, *American Economic Review*, Vol. 53, No. 3, 1963, pp. 433–443.

⁸⁹⁷ Not all equity investors in the New Zealand market can fully utilise imputation credits. In particular, international investors cannot utilise imputation credits. However, this does not mean such investors have a higher estimate of the cost of capital than domestic investors. This is discussed further at paragraphs 6.4.33 - 6.4.35.

⁸⁹⁸ Ross, S., The Determination of Financial Structure: The Incentive Signalling Approach, *Bell Journal of Economics*, Spring, 1977, pp. 23-40.

⁸⁹⁹ Myers, S., Majluf, N., Corporate Financing and Investment Decisions when Firms have Information that Investors do not Have, *Journal of Financial Economics*, Vol. 13, 1984, pp. 187-221.

⁹⁰⁰ Jensen, M., Meckling, W., Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, *Journal of Financial Economics*, Vol. 3, 1976, pp. 305-360; Jensen, M., Agency Costs of Free Cash Flow, Corporate Finance and Takeovers, *American Economic Review*, Vol. 76, 1986, pp. 323-329.

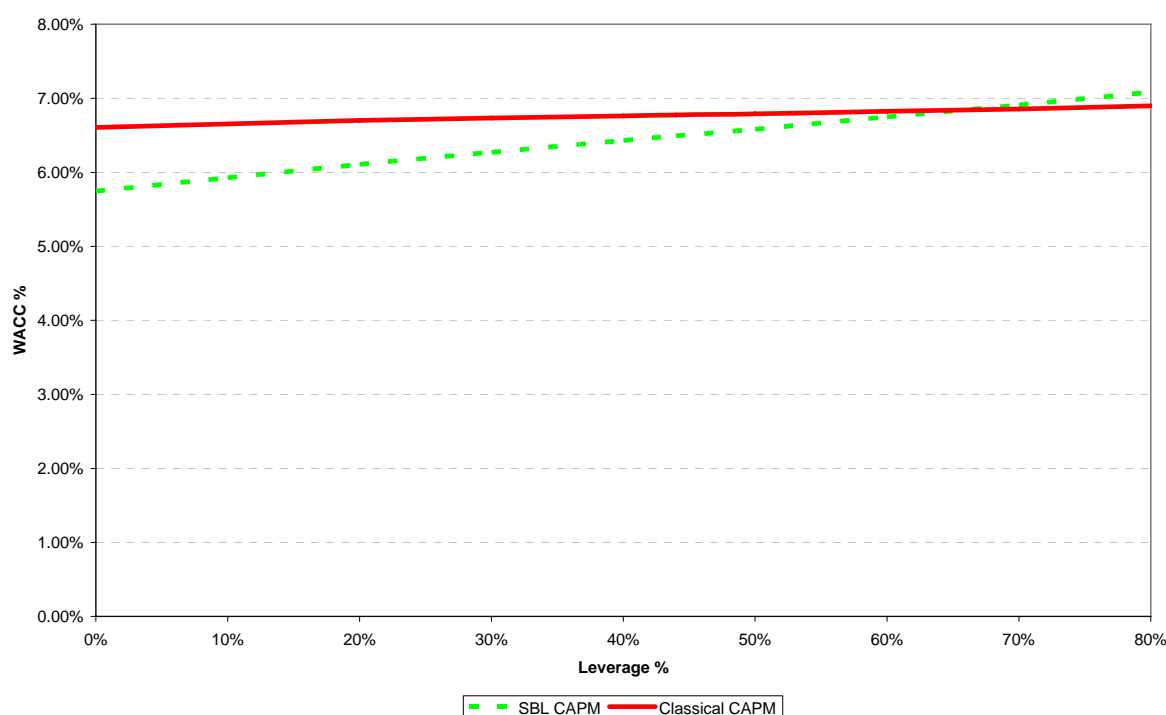
⁹⁰¹ This assumes a risk-free rate of 4.64%, a debt premium of 2.35% (including debt issuance cost of 0.35%), an asset beta of 0.34, a TAMRP of 7.1% (equivalent to an MRP of 5.8% for the classical CAPM), average investor tax rate of 28.2% and average corporate tax rate of 28.4%. For both WACC estimates the tax neutral formula for the effects of leverage

WACC is illustrated in Table H1 and Figure H1 below. This contrasts the post-tax WACC estimated using the simplified Brennan-Lally CAPM and the classical CAPM.

Table H1 Leverage and Post-tax WACC⁹⁰²

Leverage	Post-tax cost of capital estimated using the simplified Brennan-Lally CAPM	Post-tax cost of capital estimated using the classical CAPM
0%	5.75%	6.61%
20%	6.11%	6.71%
40%	6.43%	6.77%
60%	6.75%	6.83%

Figure H1 Leverage and the post-tax WACC estimated using the simplified Brennan-Lally CAPM versus the classical CAPM



H3.9 The table and figure above illustrate how the post-tax WACC, estimated using the simplified Brennan-Lally CAPM for the cost of equity, increases as leverage increases, while holding all other parameters constant. The table shows that, using the simplified Brennan-Lally CAPM for the cost of equity, the post-tax WACC would be approximately 5.75% assuming zero leverage. The post-tax WACC would increase to 6.1% at an assumed leverage of 20%. At an assumed leverage of 60%, the post-tax WACC would be approximately 6.75%.

on betas has been used. These parameters values are consistent with the reasonableness tests the Commission has undertaken, (see Appendix H13).

⁹⁰² The estimates in the table are mid-point estimates of the post-tax WACC.

- H3.10 In contrast, the table and figure above illustrates how the post-tax WACC estimated using the classical CAPM for the cost of equity increases only marginally as leverage increases, while holding all other parameters constant. The Commission notes this increase in WACC with leverage, where the classical CAPM is used for the cost of equity, is an unconventional result which reflects the current very high debt premiums.
- H3.11 This increase in the cost of capital with higher levels of leverage under the simplified Brennan-Lally CAPM for estimating the cost of equity:
- is inconsistent with both capital structure theory and observed practice;
 - if incorporated in the cost of capital IM, would risk creating an incentive for suppliers of regulated services to increase their actual leverage in order to generate higher allowed rates of return or to propose higher benchmark leverage so as to receive a higher estimate of the cost of capital; and
 - can be large, particularly when debt premiums (which affect the cost of debt) are high.
- H3.12 Where the simplified Brennan-Lally CAPM is used in the context of information disclosure or default/customised price-quality regulation, suppliers of regulated services have an incentive to assert that the notional leverage should be as high as possible. This is because, when estimating the cost of capital using the simplified Brennan-Lally CAPM to estimate the cost of equity, any increase in leverage will flow through into a higher allowed cost of capital.
- H3.13 Similarly, if suppliers' allowed cost of capital is influenced by their actual leverage, with the allowed cost of capital being estimated from the simplified Brennan-Lally CAPM to estimate the cost of equity, suppliers have an incentive to increase their actual leverage in order to increase the allowed cost of capital. Suppliers would recognise that, although the allowed cost of capital has risen, the actual market cost of capital they face is likely to have remained unchanged.⁹⁰³
- H3.14 This anomaly (of the cost of capital increasing with leverage) is not unique to the Commission's current development of IMs using the simplified Brennan-Lally CAPM. A similar anomaly with respect to the classical CAPM was noted by the UK Competition Commission in a recent price-setting review of Heathrow/Gatwick. The UK Competition Commission stated that:⁹⁰⁴

The key feature of these charts is the upward-sloping relationship that exists between a firm's gearing and its pre-tax cost of capital when one assumes a zero debt beta. This suggests that gearing up increases a firm's pre-tax cost of capital and therefore warrants the inclusion of a higher rate of return in price caps—something that can be seen explicitly in Table 1 at the beginning of this appendix where BAA's estimates for the

⁹⁰³ The Commission notes that the de-levering of the equity beta is based on the market value of the comparative firm sample. Therefore, to be consistent with the asset beta the re-levering should also be based on a market value leverage. As only three of the suppliers affected by Part 4 have market value data available to estimate the market value of leverage the use of actual leverage for each supplier will bias the cost of capital for the majority of the regulated suppliers that are covered by Part 4 as their actual leverage would be based on book values.

⁹⁰⁴ UK Competition Commission, *A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd)*, Appendix F - Cost of Capital, 28 September 2007, paragraphs 88-90, p. F23.

pre-tax cost of capital at Heathrow increase with the use of a higher gearing figure, while estimates of the pre-tax cost of capital at Gatwick fall on the assumption of lower gearing.

We find this overall position difficult to reconcile with the observed behaviour of a range of firms in a broad sample of different industries. In the regulated sectors, the trend in recent years has been for firms to inject more debt into their capital structures on the apparent assumption that higher levels of gearing represent more efficient financing. Indeed, ADI has told us that its own decision to move BAA's gearing from around 34 per cent to more than double this figure would improve the efficiency of BAA's financing.

Given this starting point, we do not accept the argument that higher levels of gearing produce a higher cost of capital. We do not believe that this is a credible characterization of the returns that investors require at different levels of gearing

H3.15 The Commission too would not want to set a higher cost of capital due to higher levels of leverage. To address this anomaly, the UK Competition Commission used debt betas.⁹⁰⁵ The use of debt betas was generally not supported by submissions in New Zealand,⁹⁰⁶ or the Expert Panel, although the Expert Panel recommended the Commission consider debt betas if they are significant.⁹⁰⁷

H3.16 At the Cost of Capital Workshop, representatives of the suppliers of regulated services recognised that the cost of capital increases with leverage under the

⁹⁰⁵ A debt beta measures the systematic risk associated with a firm's debt. A detailed discussion on debt betas is included in the debt beta section (section H9).

⁹⁰⁶ Aurora Energy Limited, *Submission to the Commerce Commission on its Discussion Paper on Input Methodologies*, 14 August 2009, p.18; LECG for ENA, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, 11 August 2009, p. 18; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report on behalf of NZAA, 31 July 2009, p. 27; Maui Development Limited, *Submission to the Commerce Commission on the Input Methodology Discussion Paper*, July 2009, pp. 19-20; NZ Airports, *Submission by NZ Airports Association on the Commerce Commission Input Methodologies Discussion Paper*, 31 July 2009, pp. 49-50; Powerco Limited, *Input Methodologies Discussion Paper*, 14 August 2009, p. 30; PwC, Revised Draft Guideline s- *Submission to Commerce Commission*, August 2009, Report on Behalf of Powerco, p. 26; PwC for 17 EDBs, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, 14 August 2009, pp. 11-12; Synergies Economic Consulting for Vector, *Initial WACC Review*, 13 August 2009, pp. 23-25; Synergies Economic Consulting for Vector, *WACC Review Final*, 31 August 2009, pp. 36-39; Telecom, Annex B: *Submission on Commerce Commission Revised Draft Guidelines for estimating the Cost of Capital*, August 2009; ENA, *Cross Submission on the Cost of Capital Workshop*, 2 December 2009, p. 9; Telecom Limited, *Post-workshop Submission on the Cost of Capital*, Attachment: PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, 2 December 2009, p. 12; Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital*, Report on Behalf of NZAA, 2 December 2009, p. 86; Electricity Networks Association, *Submission on EDBs (Input Methodology) Draft Determination and Reasons Paper*: Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital Parameter Estimates*, 13 August 2010, p. 56; Major Electricity Users' Group, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, Appendix; NZ Airports Association, *Submission on Draft Information Disclosure Determination and Draft Reasons Paper*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper - Report for NZAA*, 12 July 2010, pp. 36-37; Auckland International Airport Limited, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p. 12; Christchurch International Airport Limited, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p. 4; NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p. 39; NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, Attachment: Uniservices, *Comments on Air New Zealand's and Board of Airline Representatives New Zealand Incorporated's Submissions to the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper: report prepared for New Zealand Airports Association*, 3 August 2010, p. 16.

⁹⁰⁷ Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of capital Methodology*, December 2008, pp. 23-24.

simplified Brennan-Lally CAPM but were unconcerned by this. Representatives of consumers of regulated services argued that it was inappropriate to allow suppliers' cost of capital to increase with leverage. There was broad agreement that the positive relationship between leverage and cost of capital when applying the simplified Brennan-Lally CAPM would be counter-intuitive. The Commission sought clarification on this matter from Dr Lally.

Advice from Dr Lally

H3.17 In advice to the Commission, Dr Lally attributed the anomalous increase in the estimates of the cost of capital with increased leverage to the combined effects of the following on the estimate of the debt premium:⁹⁰⁸

- the assumption that the debt beta is zero;
- a liquidity premium within the cost of debt that has no counterpart within the cost of equity; and
- the use of the promised debt premium rather than the more conceptually correct expected debt premium which would be lower. (The higher the debt premium, the higher the increase in the cost of capital for any given increase in the level of leverage.)

H3.18 Dr Lally outlined that, if the simplified Brennan-Lally CAPM was used by the Commission, then it could adopt one of three options (all of which are further discussed below):⁹⁰⁹

- accepting the anomaly and continuing to use the simplified Brennan-Lally CAPM (status quo);⁹¹⁰
- setting leverage equal to zero; and
- using a non-zero debt beta and defining the cost of debt as the expected yield plus an allowance for bankruptcy costs.

H3.19 Dr Lally considered that the policy to minimise the effect of the anomaly was far from clear and that measurement difficulties would seem to rule out the third option. Dr Lally concluded that:⁹¹¹

When using the simplified Brennan-Lally CAPM in conjunction with the simplified beta gearing model, WACC ... rises with leverage and therefore implies that leverage is undesirable. However, the use of debt by companies is typical. This implies that companies are acting irrationally or that there is some deficiency in the models used to estimate WACC. This paper shows that there are some deficiencies in the WACC model currently employed by the Commerce Commission, but these are not readily correctable, leaving the choice between the status quo (which overstates WACC) and a simple alternative in the form of setting WACC equal to the unlevered cost of capital

⁹⁰⁸ Lally, M., *WACC and Leverage*, Report to the Commerce Commission, 17 November 2009, pp. 3-5.

⁹⁰⁹ Lally, M., *WACC and Leverage*, Report to the Commerce Commission, 17 November 2009, p. 5.

⁹¹⁰ Dr Lally considered that this option would overestimate the cost of capital as the cost of debt would be improperly defined as the promised yield rather than as the expected yield plus an allowance for bankruptcy costs.

⁹¹¹ Lally, M., *WACC and Leverage*, Report to the Commerce Commission, 17 November 2009, p. 7.

(which would understate WACC). Choosing between these two options is a judgement matter for the Commission.

Possible solutions

H3.20 The Commission considers that the relationship between cost of capital and leverage when applying the simplified Brennan-Lally CAPM to estimate the cost of equity is a significant matter as the effect of leverage on the cost of capital estimate can be substantial (as illustrated in Table H1 and the accompanying discussion). Therefore, the Commission considers that accepting the anomaly is not an appropriate solution.

H3.21 In its IM Draft Reasons Papers the Commission identified an additional option, which was a variation of Dr Lally's option (i) above. This option is to use a notional leverage which attempts to choose the point where the model neither overstates nor understates the cost of capital. In order to ensure that the cost of capital estimate does not create perverse incentives when using the simplified Brennan-Lally CAPM, the Commission has considered the following options:

Option a setting leverage equal to zero;

Option b setting a notional leverage that either is fixed:

- i. for all services regulated under Part 4 of the Act;
- ii. for each service and is based on the average leverage of the comparative firms sample used to derive the asset beta estimate; and

Option c using a non-zero debt beta.

These options are discussed below.

Option a: Setting a zero leverage

H3.22 An advantage of setting leverage equal to zero and using the simplified Brennan-Lally CAPM to estimate the expected cost of equity capital (and hence the cost of capital) is that the allowable regulatory rate of return would be invariant to the leverage choice of a supplier. This would avoid the incentive problems discussed in paragraphs H3.12 and H3.13. WACC being invariant to leverage also does not contradict capital structure theory in the way that WACC increasing with leverage at all levels of leverage does (see paragraphs H3.4 to H3.7).

H3.23 In submissions on the Revised Draft Guidelines and the draft IM, Ireland, Wallace & Associates (for MEUG) noted that if the simplified Brennan-Lally CAPM is used to estimate the cost of equity then the WACC is sensitive to leverage and is lowest when leverage is equal to zero. They submit that on efficiency grounds (i.e. the lowest cost of capital constitutes an appropriate benchmark), the best estimate of the efficient cost of capital structure for regulated suppliers, if the simplified Brennan-Lally CAPM is being used, is to assume zero leverage.⁹¹²

⁹¹² Major Electricity Users' Group, *Submission on Draft Input Methodologies and Draft Cost of Capital Guidelines*, Attachment: Ireland, Wallace & Associates Limited, *Submission on the Input Methodologies Discussion Paper: prepared for Major Electricity Users' Group*, 31 July 2009; Major Electricity Users' Group, *Cross-Submission on Draft Input Methodologies and Draft Cost of Capital Guidelines*, Attachment: Ireland, Wallace & Associates Limited, *Cross-Submission on the Input Methodologies Discussion Paper: prepared for Major Electricity Users' Group*, 3 September 2009; Major Electricity Users' Group, *Post-Workshop Submission on Cost of Capital Workshop*,

- H3.24 AECT, ENA, Powerco, Telecom, PwC (for Telecom), Unison, Uniservices (for NZAA) and Vector all disagreed with the zero leverage assumption proposed by the submissions from Ireland, Wallace & Associates (for MEUG).⁹¹³ They submitted the zero leverage assumption is inappropriate, as it does not recognise that most infrastructure firms have debt in their capital structures and is inconsistent with workably competitive market outcomes, as debt financing (up to a point) is considered to lower WACC. These arguments generally imply that leverage reduces WACC in practice, but adoption of a non-zero leverage and the simplified Brennan-Lally CAPM would result in a higher WACC.
- H3.25 ENA and PwC (for Telecom) have argued that a practical application of a simplified modelling setup (assuming a debt beta of zero) should not be allowed to be used as a theoretical framework for arguing for an extreme leverage assumption of zero leverage.⁹¹⁴
- H3.26 NZIER (for BARNZ) noted that setting leverage equal to zero was a logical position for the Commission but did not prefer this option. NZIER submitted that in balancing the relevant factors the IM should provide for a moderate benchmark leverage in each service.⁹¹⁵
- H3.27 Other considerations with a zero leverage assumption are that:

Attachment: Ireland, Wallace & Associates Limited, *Post-Workshop Submission on the Input Methodologies Cost of capital: prepared for Major Electricity Users' Group*, 2 December 2009; Major Electricity Users' Group, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Ireland, Wallace & Associates Limited, *Submission on the Cost of Capital*, 13 August 2010.

⁹¹³ Auckland Energy Consumer Trust, *Post-Workshop Cross-Submission to Commerce Commission on Cost of Capital Workshop*, 2 December 2009, pp. 24-25; Electricity Networks Association, *Cross submission on the cost of capital workshops*, 2 December 2009, pp. 7-8; Powerco Limited, *Cross submission on Input Methodologies Discussion Paper*, 28 August 2009, p. 2; Telecom, *Cross Submission on the Revised Draft Guidelines for Estimating the Cost of Capital*, 28 August 2009, p. 5; Telecom Limited, *Post-workshop Submission on the Cost of Capital*, Attachment: PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, 2 December 2009, p. 10; Unison, *Cross submission on Input Methodologies*, 28 August 2009, p. 4; Vector, *Cross-submission to the Commerce Commission on Submissions on the Input Methodologies Discussion Paper*, 28 August 2009, pp. 8-9; Electricity Networks Association, *Cost of Capital Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, 3 September 2010, p. 1; Electricity Networks Association, *Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, Attachment: PwC Report, 3 September 2010, p. 3; Powerco Limited, *Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, 31 August 2010, pp. 7-8; Unison Networks Ltd, *Cost of Capital Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determinations and Reasons Paper*, 2 September 2010, pp. 7-8; Vector Ltd, *Cost of Capital Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determinations and Reasons Paper*, 3 September 2010, pp. 4-7; NZ Airports Association, *Post-Workshop Submission on Input Methodologies Cost of Capital*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of - Report for NZAA*, 2 December 2009, p. 87; NZ Airports Association, *Submission on Draft Information Disclosure Determination and Draft Reasons Paper*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper - Report for NZAA*, 12 July 2010, pp. 23-25; NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, Attachment: Uniservices, *Comments on Air New Zealand's and Board of Airline Representatives New Zealand Incorporated's Submissions to the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper: report prepared for New Zealand Airports Association*, 3 August 2010, p. 15.

⁹¹⁴ Electricity Networks Association, *Cross Submission on the Cost of Capital Workshop*, 2 December 2009, p. 8; Telecom Limited, *Post-workshop Submission on the Cost of Capital*, Attachment: PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, 2 December 2009, p. 10.

⁹¹⁵ Board of Airline Representatives New Zealand Incorporated, *Post Workshop Submission on the Input Methodologies and Cost of Capital*, Attachment: The New Zealand Institute of Economic Research Incorporated, *Cost of Capital: prepared for the Board of Airline Representatives New Zealand Incorporated*, 28 November 2009, pp. 2-3.

- there is no regulatory precedent by overseas regulators or the Commission for setting leverage equal to zero;
- a leverage assumption of zero is not consistent with the observed behaviour of firms in workably competitive markets as they have debt;⁹¹⁶
- Dr Lally advises that at zero leverage the result of using the model to estimate the cost of equity would tend to underestimate the true cost of capital;⁹¹⁷ and
- using zero leverage has implications for other parameters within the cost of capital framework, such as the equity beta.

H3.28 In summary, a zero level of leverage is the optimal leverage position under the simplified Brennan-Lally CAPM with an assumed debt beta of zero (i.e. the cost of capital is minimised at this point). However, with a more realistic value of the debt beta, this may no longer be the case. Further, zero leverage is inconsistent with practice, as suppliers' actual capital structure includes a portion of debt. Therefore, in the interests of maintaining a relationship with suppliers' actual capital structure, the Commission considers that the notional leverage should be greater than zero. If zero leverage was applied, and it was considered to be an underestimate of the cost of capital, then a margin would have to be added. There is presently no theoretical framework or precedent for estimating such a margin. A zero leverage assumption would also reduce the cost of capital to just the cost of equity capital. In addition, this assumption would set the equity beta equal to the asset beta when estimating the cost of equity.

Option b: Setting a notional leverage

H3.29 Adopting a positive 'notional' level of leverage would be preferable to adopting a zero leverage assumption. This would limit the adverse impact of the anomaly in the simplified Brennan-Lally CAPM, and maintain a relationship with suppliers' actual capital structure. The approach of using a notional level of leverage is consistent with:

⁹¹⁶ It has been suggested in the corporate finance literature that capital structure may reflect, among other things, (i) a desire to take advantage of tax benefits (Graham, J. R., Debt and the Marginal Tax Rate, *Journal of Financial Economics*, Vol. 41, 1996, pp. 41–73), (ii) a desire to mitigate free cash flow agency problems (Jensen, M. C., Agency Costs of Free Cash Flow, Corporate Finance and Takeovers, *American Economic Review*, Vol. 76, 1986, pp. 323–329), (iii) imperfect or incomplete capital markets (Rose, J. R., The Cost of Capital, Corporation Finance, and the Theory of Investment: Comment, *American Economic Review*, Vol. 49, 1959, pp. 638–639 and Modigliani, F., and Miller, M., Corporate income taxes and the cost of capital: a correction, *American Economic Review*, Vol. 53, No. 3, 1963, pp. 433–443), (iv) the prospective costs of financial distress or bankruptcy (Myers, S. C., The Capital Structure Puzzle, *Journal of Finance*, Vol. 39, 1984, pp. 575–592), (v) the availability of internal finance (Myers, S., and Majluf, N., Corporate Financing and Investment Decisions when Firms have Information that Investors do not Have, *Journal of Financial Economics*, Vol. 13, 1984, pp. 187–221), (vi) the nature of strategic interactions between competitors, suppliers and customers (Harris, M., and Raviv, A. The Theory of Capital Structure, *Journal of Finance*, Vol. 46, 1991, pp. 297–355), (vii) whether or not the firm is in the market for corporate control (Harris, M., Raviv, A., Corporate Control Contests and Capital Structure, *Journal of Financial Economics*, Vol. 20, 1988, pp. 55–86 and Stulz, R., Managerial control of voting rights: Financing policies and the market for corporate control, *Journal of Financial Economics*, Vol. 20, 1988, pp. 25–54), and (viii) the firm's growth prospects (Graham, J. R., How Big Are the Tax Benefits of Debt?, *Journal of Finance*, Vol. 55, 2000, pp. 1901–1941). As yet, there is no completely unified theory on the determinants of optimal capital structure (for regulated or unregulated firms).

⁹¹⁷ See Lally, M., *WACC and Leverage*, Report to the Commerce Commission, 17 November 2009, pp. 5-6.

- i. the approach taken in previous Commission regulatory decisions, where a service specific notional leverage assumption for the regulatory service in question has been applied;
- ii. the approach taken by the majority of overseas regulators; and
- iii. the approach agreed to by most parties in their submissions on this matter.

i. Notional leverage set at the same level for all regulated services under Part 4

H3.30 In the Draft Reasons Papers the Commission adopted ‘notional’ leverage of 40% for all regulated services so as to limit the adverse impact of the anomaly in the simplified Brennan-Lally CAPM.⁹¹⁸

H3.31 The Draft Reasons Papers discussed how the Commission could set the level of notional leverage for all services.⁹¹⁹ The Draft Reasons Papers noted that “[g]iven the variation of leverage levels among regulated suppliers, there is no one ‘right’ level of leverage”.⁹²⁰ It also explained that the Commission had adopted a notional leverage assumption in previous regulatory decisions, although these leverage assumptions differed between the regulated services. Therefore, applying a single level of notional leverage across all regulated services would require the exercise of judgement by the Commission.

H3.32 In setting a single notional leverage assumption the Commission sought to “balance the legitimate use of debt capital in the capital structure of suppliers of services regulated under Part 4 of the Act with the need to protect customers of the suppliers of these regulated services from the substantial consequences and costs if financial distress of a supplier of regulated services were to occur”.⁹²¹

H3.33 In setting the level of notional leverage for all regulated services, the Commission considered actual leverage for regulated firms in New Zealand and overseas, the level of leverage assumed in prior regulatory decisions in New Zealand (25%-40%) and the leverage assumption in regulatory decisions overseas. Ultimately, the Commission considered greatest informational value was from New Zealand regulatory precedent and adopted 40% as the estimate for the level of notional leverage. This estimate was consistent with the leverage assumed in previous Commission energy decisions, but at the top end of the range submitted by New Zealand airports. A number of submissions were received on the issue of leverage.

H3.34 Ireland, Wallace & Associates (for MEUG) submitted that the appropriate cost of capital model is the unlevered cost of capital which is indifferent to leverage, and that the Commission’s proposed notional leverage approach achieves a cost of

⁹¹⁸ Commerce Commission, *Input Methodologies Airport Services, Draft Reasons Paper*, section 6.5, pp. 168-182; Commerce Commission, *Input Methodologies Electricity Distribution Services, Draft Reasons Paper*, section 6.5, pp. 224-238; Commerce Commission, *Input Methodologies Gas Pipeline Services, Draft Reasons Paper*, section 6.5, pp. 206-220.

⁹¹⁹ Commerce Commission, *Input Methodologies Airport Services, Draft Reasons Paper*, paragraphs 6.5.40-6.5.61; Commerce Commission, *Input Methodologies Electricity Distribution Services, Draft Reasons Paper*, paragraphs 6.5.41-6.5.62, pp. 233-238; Commerce Commission, *Input Methodologies Gas Pipeline Services, Draft Reasons Paper*, paragraphs 6.5.41-6.5.62, pp. 215-220.

⁹²⁰ Commerce Commission, *Input Methodologies Airport Services, Draft Reasons Paper*, paragraph 6.5.40; Commerce Commission, *Input Methodologies Electricity Distribution Services, Draft Reasons Paper*, paragraphs 6.5.41, pp. 233; Commerce Commission, *Input Methodologies Gas Pipeline Services, Draft Reasons Paper*, paragraphs 6.5.41, p. 215.

⁹²¹ Commerce Commission, *Input Methodologies Airport Services, Draft Reasons Paper*, paragraph 6.5.58.

capital which is indifferent to leverage but has elevated the cost of capital above that of the unlevered cost of capital. They submitted that the practical consequences are material and adverse for consumers.⁹²²

H3.35 PwC (for ENA and Telecom) submitted, in conjunction with a worked example to demonstrate, that the:^{923, 924}

Commission is technically wrong to attempt to apply a single fixed leverage assumption to all regulated firms. If debt betas are to be excluded from the WACC analysis (which we concur with), then to be consistent the notional leverage used in the WACC estimation should be close to the average leverage of the comparator companies used to derive the (average) beta estimate. This is a fundamental requirement in order to be able to justify application of a “short cut” approach and thus ignore debt betas.

H3.36 PwC considered that if the Commission were to apply a zero debt beta assumption and a leverage estimate that was lower than the leverage of the comparative firms sample used to derive the asset beta, this would result in an under-estimation of cost of capital for EDBs, GPBs and Transpower. The Commission notes that under this logic the reverse is also true for Airports (i.e. assuming 40% notional leverage will overstate the cost of capital for Airports).

H3.37 CEG (for Vector), ENA and Powerco made a similar point that the notional leverage assumption should be based on the sample of comparator suppliers.⁹²⁵ Transpower submitted that as it was subject to IPP regulation there is no need to apply a service-

⁹²² Major Electricity Users' Group, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Ireland, Wallace & Associates Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses) Reasons Paper: prepared for Major Electricity Users' Group*, 13 August 2010, p. 2; Major Electricity Users' Group, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010; Major Electricity Users' Group, *Submission on EDBs (Input Methodology) Draft Determination and Reasons Paper, Appendix: MEUG comments on Pan Industry Input Methodology for Cost of Capital*, 13 August 2010, pp. 4-7.

⁹²³ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, p. 8; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, p. 10.

⁹²⁴ PwC (and others) had made similar comments in other submissions during the consultation period on the IM and RDG. See PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, Report on Behalf of 17 EDBs, 2 December 2009, p. 10; PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, Report on Behalf of Telecom, 2 December 2009, pp. 9-11; PricewaterhouseCoopers, *Commerce Commission WACC Conference*, Report on Behalf of Powerco, 2 December 2009, pp. 14-15 Electricity Networks Association, *Cross Submission on the Cost of Capital Workshop*, 2 December 2009, pp. 7-8; Wellington Electricity, *Post-workshop submission for the Commerce Commission's cost of capital workshop, November 12 and 13, 2009*, 3 December 2009, pp. 8-10.

⁹²⁵ Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 32-35; Electricity Networks Association, *Cost of Capital Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, 3 September 2010, p. 1; Powerco Limited, *Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, 2 September 2010, p. 7.

wide notional leverage assumption and instead Transpower's actual forward-looking leverage should be used.⁹²⁶

H3.38 In its cross-submissions for ENA, PwC submitted that:⁹²⁷

Should the Commission wish to set a regulatory WACC that is indifferent to leverage, the principled approach would be for the Commission to fix an industry-wide leverage assumption that is consistent with the observed leverage of the comparator companies used to derive the asset beta assumption. Failing this, the Commission will then need to re-consider introducing debt betas into the analysis.

H3.39 PwC preferred the use of a service-wide leverage assumption based on the leverage of the comparator firms to the use of non-zero debt betas.

H3.40 In adopting the 40% notional assumption, the Commission's key concern was to address the anomaly in the simplified Brennan-Lally CAPM which sees the cost of capital increasing with leverage. The Commission sought to protect consumers from the risks of suppliers increasing leverage, and thereby increasing the risk of financial distress, as this was inconsistent with the Part 4 purpose. As PwC has outlined, there are other ways to address the anomaly which are technically more correct.

H3.41 The option of setting a service-specific notional leverage is discussed below. The option of introducing debt betas is considered in the following section.

ii. Setting service-specific notional leverage based on leverage of the comparator companies

H3.42 Using a notional leverage assumption will remove the variation of the cost of capital due to changes in leverage. But, as discussed above, a number of submissions considered that if the Commission used a zero debt beta with a notional leverage assumption that was not consistent with the leverage of the comparative firms sample used to derive the asset beta, the Commission will be introducing an unnecessary bias into the cost of capital. As a result, submitters considered that the leverage assumption for a regulated service should be based on the average leverage of the associated comparative firms sample used in estimating the asset beta for that regulated service.

H3.43 Appendix H8 identifies the comparative firms sample and the process for choosing the comparative firms sample for EDBs, Transpower and GPBs. Table H2 displays the results of the individual firms' last five-year average (market value) leverage, which is consistent with the leverage used to estimate the asset beta. This results in an overall average leverage for the sample of 44%.

⁹²⁶ Transpower New Zealand Ltd., *Submission on Transpower (Input Methodologies) Draft Reasons Paper, Cost of Capital Decisions*, August 2010, p. 10.

⁹²⁷ Electricity Networks Association, *Cross-Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Cross-Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination 2010: a report prepared for Electricity Networks Association*, September 2010, p. 3.

Table H2 List of Comparable Firms and the Average Market Leverage for 2005-2010

Name	Average Leverage for 2005-2010
Horizon Energy	23%
Vector	56%
DUET	73%
Spark Infrastructure	50%
SP AusNet	46%
APA	59%
Envestra	71%
Hastings Diversified Utilities	35%
National Grid	48%
Allegheny Energy	39%
Allete	24%
Alliant Energy	32%
Ameren	43%
American Electric Power	48%
Avista Corp	51%
Black Hills	41%
Central Vermont Public Service	36%
CH Energy	34%
Cleco	34%
CMS Energy	67%
Consolidated Edison	43%
Constellation Energy	29%
Dominion Resources	41%
DPL	30%
DTE Energy	54%
Duke Energy	36%
Edison International	39%
El Paso Electric	39%
Empire District Electric	47%
Entergy	36%

Name	Average Leverage for 2005-2010
Exelon	24%
FirstEnergy	42%
Great Plains Energy	44%
Hawaiian Electric	21%
Idacorp	46%
Integrys Energy	43%
ITC Holdings	45%
MGE Energy	31%
NextEra Energy [formerly FPL Group]	39%
Northeast Utilities	52%
Northwestern Corp	43%
NSTAR	45%
NV Energy	59%
OGE Energy	37%
Pepco	55%
PG&E	42%
Pinnacle West	46%
PNM Resources	59%
PPL Corporation	35%
Progress Energy	47%
Public Service Enterprise	36%
Scana Corp	46%
Southern Corp	38%
Teco Energy Corp	50%
UIL Holdings Corp	41%
Unisource Energy Corp	61%
Unitil Corp	55%
Westar Energy	49%
Wisconsin Energy	46%
Xcel Energy	47%
AGL Resources	46%

Name	Average Leverage for 2005-2010
Atmos Energy Corp	49%
Centerpoint Energy	65%
Chesapeake Utilities Corp	35%
Laclede Group	41%
National Fuel Gas Co	22%
New Jersey Resources Corp	29%
Nicor Inc	33%
Nisource Inc	58%
Northwest Natural Gas Co	37%
Oneok Inc	55%
Piedmont Natural Gas Co	34%
Sempra Energy	31%
South Jersey Industries	33%
Southwest Gas Corp	52%
Spectra Energy Corp	40%
UGI Corp	40%
Vectren Corp	45%
WGL Holdings Inc	33%
Mean market leverage	44%

H3.44 Based on this analysis the notional leverage for EDBs, GPBs and Transpower should be 44%.

H3.45 Setting a service-wide notional leverage which reflects the average leverage of the sample of comparator firms, also reflects the differences in leverage which exist between EDBs, GPBS and the other regulated services.

Option c: Non-zero debt betas

H3.46 The use of non-zero debt betas is a third alternative to address the anomaly of WACC estimates rising with leverage. Both Dr Lally and PwC identified the use of a zero debt beta as a factor in the estimates of the cost of capital increasing with leverage.⁹²⁸ The use of non-zero debt betas can reduce the impact of leverage on the estimate of the cost of capital. At a certain level, the use of debt betas could make the cost of capital invariant to leverage.

⁹²⁸ A debt beta measures a firm's systematic risk associated with borrowing. That debt does have systematic risk is evidenced by the increases in debt premiums during the GFC. Debt betas are discussed further in Appendix H9.

H3.47 The use of a non-zero debt beta was discussed by a number of submitters during consultation on the IM.⁹²⁹ However a majority of these submitters did not favour the use of debt betas. Many of these submitters emphasised the practical difficulties in estimating the debt beta. The difficulties of estimating the debt beta are discussed in the debt beta section (Appendix H9).

⁹²⁹ Aurora Energy Limited, *Submission to the Commerce Commission on its Discussion Paper on Input Methodologies*, 14 August 2009, p.18; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report on behalf of ENA, 11 August 2009, p. 18; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report on behalf of NZAA, 31 July 2009, p. 27; Maui Development Limited, *Submission to the Commerce Commission on the Input Methodology Discussion Paper*, July 2009, pp. 19-20; NZ Airports, *Submission by NZ Airports Association on the Commerce Commission Input Methodologies Discussion Paper*, 31 July 2009, pp. 49-50; Powerco Limited, *Input Methodologies Discussion Paper*, 14 August 2009, p. 30; PricewaterhouseCoopers, *Revised Draft Guideline s- Submission to Commerce Commission, August 2009*, Report on Behalf of Powerco, p. 26; Telecom Limited, *Post-workshop Submission on the Cost of Capital*, Attachment: PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, 2 December 2009, pp. 9-11; PricewaterhouseCoopers, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, pp. 11-12; PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, Report on Behalf of 17 EDBs, 2 December 2009, pp. 9-11; Synergies Economic Consulting, *Initial WACC Review*, Report prepared for Vector, 13 August 2009, pp. 23-25; Synergies Economic Consulting, *WACC Review Final*, Report prepared for Vector 31 August 2009, pp. 36-39; Telecom, *Annex B: Submission on Commerce Commission Revised Draft Guidelines for estimating the Cost of Capital*, August 2009; NZ Airports Association, *Submission on Draft Information Disclosure Determination and Draft Reasons Paper*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper – Report for NZAA*, 12 July 2010, pp. 36-37; Auckland International Airport Limited, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p. 12; Christchurch International Airport Limited, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p. 4; NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p. 39; NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, Attachment: Uniservices, *Comments on Air New Zealand's and Board of Airline Representatives New Zealand Incorporated's Submissions to the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper: report prepared for New Zealand Airports Association*, 3 August 2010, p. 16; Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, p. 8 and p. 56; Major Electricity Users' Group, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, Appendix; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, p. 10 and p. 53 ; PricewaterhouseCoopers, *Commerce Commission WACC Conference*, Report on Behalf of Powerco, 2 December 2009, pp. 14-15 Electricity Networks Association, *Cross Submission on the Cost of Capital Workshop*, 2 December 2009, pp. 7-8; Wellington Electricity, *Post-workshop submission for the Commerce Commission's cost of capital workshop, November 12 and 13, 2009*, 3 December 2009, pp. 8-10; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 32-35; Electricity Networks Association, *Cost of Capital Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, 3 September 2010, p. 1; Powerco Limited, *Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, 2 September 2010, p. 7; Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, p.11; Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Officer R. and Bishop S., *Independent Review of Commerce Commission WACC proposals for Transpower*, 5 August 2010, pp. 22-24.

- H3.48 Transpower and its experts Officer and Bishop favoured the use of debt betas in their submissions on the EDBs Draft Reasons Paper.^{930,931} Officer and Bishop considered the assumption that the beta of BBB+ debt was zero was unrealistic and would tend to bias downwards the asset beta and the regulated cost of capital.
- H3.49 On the issue of bias, the Commission notes that if the leverage of the individual entities from the sample of comparative firms is used when de-levering the respective entity's equity beta and the average leverage of the sample of comparative firms is used in the re-levering of the average estimated asset beta, then the resulting WACC estimate will not be biased (upwards or downwards) even if the debt beta is set at zero. Alternatively, if the correct debt betas are consistently incorporated in the de-levering process and the re-levering process, and the debt premium reflects the expected yield and bankruptcy costs,⁹³² the resulting WACC too should not be biased.
- H3.50 Officer and Bishop asserted that the Commission should use a debt beta of 0.2 for Transpower.⁹³³
- H3.51 Although it is difficult to estimate the value of debt betas empirically, it is possible to back-solve for the value of the debt beta that results in the cost of capital becoming invariant to leverage. This is an approach that some practitioners in the New Zealand capital markets (e.g. equity analysts, investment bankers and corporate finance managers) have used in the past, to reflect the principle that the cost of capital should be invariant to changes in leverage. This approach would allow the observed leverage to be incorporated in the cost of capital estimate, without the level of leverage having any net impact on the cost of capital estimate.
- H3.52 Such an approach assumes that the observed debt premium is purely a reward for systematic risk. However, Dr Lally advised the Commission that the positive relationship between leverage and the cost of capital was not entirely due to systematic risk, so flattening the line entirely may be inappropriate.⁹³⁴
- H3.53 Dr Lally advised that even if the debt beta were estimated to accurately capture the true systematic risk component of the debt premium, the cost of capital/leverage relationship might still be positive. In his view, there is a liquidity premium for corporate debt (for which there is no counterpart in the cost of equity) and debt incurs bankruptcy costs, which increase as leverage does. Furthermore, Dr Lally

⁹³⁰ Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, p. 11; Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Officer R. and Bishop S., *Independent Review of Commerce Commission WACC proposals for Transpower*, 5 August 2010, pp. 22-24.

⁹³¹ BARNZ did not favour the use of debt betas but noted that adopting an estimate of zero is extremely conservative and highly favourable to the regulated suppliers. See Board of Airline Representatives New Zealand Inc, *Submission on Commerce Commission Input Methodologies (Airport Services) Draft Reasons Paper and Draft Determination*, 12 July 2010, p. 18.

⁹³² See Lally, M., *WACC and Leverage*, Report to the Commerce Commission, 17 November 2009.

⁹³³ Officer and Bishop estimated the debt beta to be 0.2. See Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Officer R. and Bishop S., *Independent Review of Commerce Commission WACC proposals for Transpower*, 5 August 2010, pp. 22-24.

⁹³⁴ Lally, M., *WACC and Leverage*, Report to the Commerce Commission, 17 November 2009.

recommended that if debt betas were used the Commission should define the cost of debt as the expected yield (not the promised yield) plus an allowance for bankruptcy costs. This raises additional estimation challenges.

H3.54 The use of a non-zero debt beta is theoretically the better approach to address the anomaly that increases in leverage can increase the cost of capital when using the CAPM framework. That is, the use of a non-zero debt beta can make the post-tax WACC estimate for each service less variant or invariant to leverage, as it should be. This would also ensure there is no incentive for regulated suppliers to increase leverage to exploit the anomaly.

Comparing Option B(ii) and Option C

H3.55 The Commission notes that technically the result from applying a service-wide notional leverage assumption based on leverage from the sample of comparative firms (Option B(ii)) and the use of a non-zero debt beta at the leverage from the sample of comparator firms (Option C) provide the same estimate of the post-tax WACC. This is demonstrated below.

H3.56 Table H3 and Figure H2 demonstrate the impact on the post-tax WACC estimated using the simplified Brennan-Lally CAPM, with debt betas of zero and 0.2 for EDBs.⁹³⁵

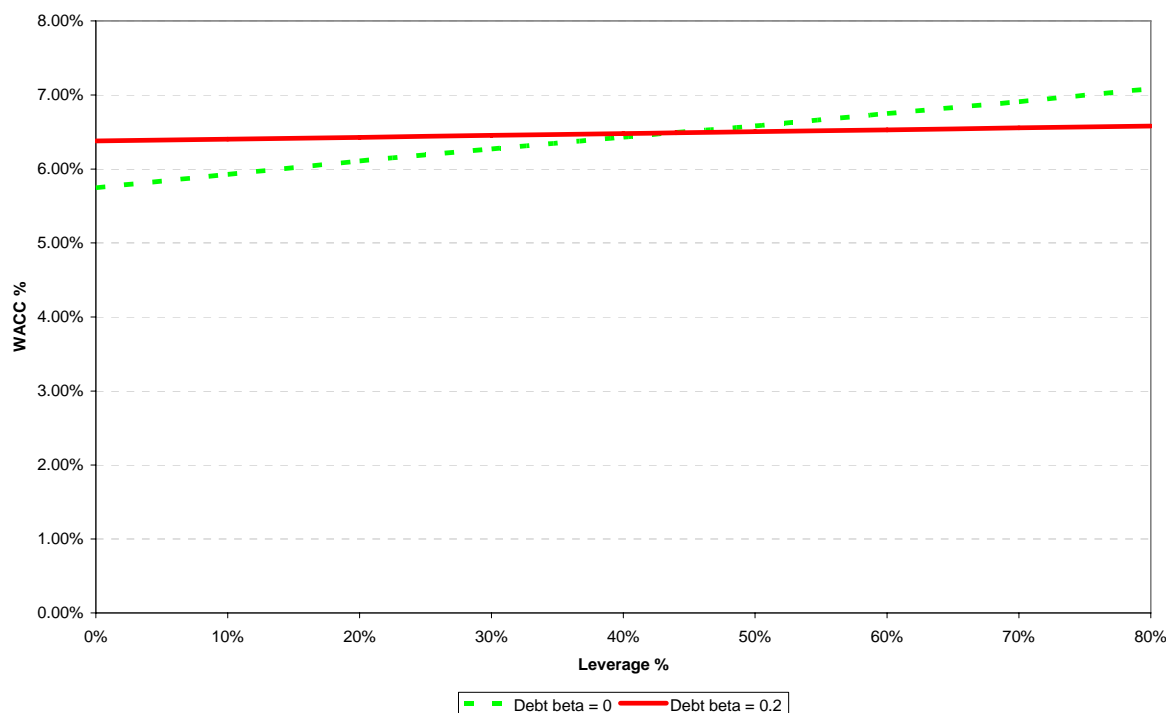
Table H3 Leverage, Debt Betas and the Post-tax WACC⁹³⁶

Leverage	Post-tax cost of capital estimated using a zero debt beta	Post-tax cost of capital estimated using a debt beta of 0.2
0%	5.75%	6.38%
20%	6.11%	6.45%
40%	6.43%	6.47%
44%	6.49%	6.49%
60%	6.75%	6.55%

⁹³⁵ This assumes a risk-free rate of 4.64%, a debt premium of 2.35% (including debt issuance costs of 0.35%), an asset beta of 0.34 for a debt beta of zero, an asset beta of 0.43 (estimated using a debt beta of 0.2 in the de-levering process) for a debt beta of 0.2, a TAMRP of 7.1%, average investor tax rate of 28.2% and average corporate tax rate of 28.4%. These parameter values are consistent with the reasonableness tests the Commission has undertaken. See appendix H13.

⁹³⁶ The estimates in the table are mid-point estimates of the post-tax WACC.

Figure H2 Leverage and the post-tax WACC estimated for EDBs and Transpower, using the simplified Brennan-Lally CAPM and different values for the debt beta.



H3.57 Assuming 44% leverage, and keeping all else constant the result of the post-tax WACC from the table and figure above demonstrate that applying Option B.(ii) (debt beta =0) or Option C (debt beta = 0.2) give the same estimate of the post-tax WACC (i.e. 6.49%).⁹³⁷

Conclusion - Option B(ii) vs. Option C

H3.58 When using the same value for leverage as the average leverage value observed in the sample of comparator companies, then whether a zero debt beta or a positive non-zero debt beta is used, it will not change the estimate of the post-tax WACC that result from applying the IM to a regulated service.

Overall Conclusion - Leverage

H3.59 The Commission considers that where the use of the simplified Brennan-Lally CAPM results in estimates of WACC which increase with leverage the model is displaying an anomaly. Given the differences can be large, the Commission considers the anomaly should be addressed. The use of a single notional leverage assumption across all services under Part 4 would achieve this, but the Commission accepts (in line with the submission from PwC) that applying this approach to each service separately would ensure the WACC is invariant to leverage in a more technically correct manner.

⁹³⁷ As part of this analysis the Commission also evaluated the resulting post-tax WACC estimated using an asset beta consistent with a debt beta of 0.1. This also resulted in the post-tax WACC of 6.49%.

- H3.60 Conceptually the use of a non-zero debt beta is superior to the use of notional leverage, as this addresses the anomaly that increases in leverage can increase the cost of capital when using the CAPM framework. That is, the use of a non-zero debt beta can make the post-tax WACC estimate for each service invariant to leverage, as it should be.
- H3.61 Most submissions continue to prefer that debt betas not be used (that is, they be set at zero), most regulators do not use debt betas, the Commission has not done so in the past, and there are practical difficulties in accurately estimating debt betas (but this is offset in part by the estimates available from regulatory decisions overseas, and the possibility of back solving for the debt beta). Further, and importantly, the Commission notes that service specific notional leverage based on leverage from the sample of comparator companies (Option B(ii)) and use of a non-zero debt beta (Option C) results in the same estimate of post-tax WACC at the leverage from the sample of comparator companies.
- H3.62 Accordingly, the final determination does not reflect the use of debt betas (as the debt beta is set at zero), though the Commission notes that if actual firm leverage were to be used, then non-zero debt betas should be used in the simplified Brennan-Lally CAPM to minimise the effect of the anomaly and ensure there is no incentive on firms to increase leverage to exploit the anomaly.
- H3.63 Transpower submitted that its actual leverage should be used. It is not appropriate to use actual leverage for any regulated supplier as this would introduce the same technical issues into the estimation of the cost of capital that PwC identified with the issue of notional leverage across different services.⁹³⁸ That is, using any leverage assumption other than that of the comparative firm sample for estimating the asset beta, would bias the estimate of the cost of capital. If actual leverage were used, non-zero debt betas would have to be used in the simplified Brennan-Lally CAPM to minimise the effect of leverage on the cost of capital and ensure there are no incentives on suppliers to increase leverage or propose increases in leverage that would exploit the anomaly in the model.⁹³⁹
- H3.64 The IM specifies a service-wide notional leverage of 44% when estimating the cost of capital for EDBs, GPBs, and Transpower.

⁹³⁸ See paragraph H3.35.

⁹³⁹ The Commission also notes that leverage should be estimated based on market values (not Transpower's book value), but that as Transpower's shares are not listed there is no observed market value of Transpower. Further, the Commission notes that Transpower's adviser, Cameron Partners, has submitted that Transpower's market value is greater than its book value (see Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Cameron Partners, *Relating to a market based rate of return assessment: a report to Transpower New Zealand Limited*, 16 August 2010). If this submission is correct, the use of an estimate of Transpower's leverage based on its book value, would overstate Transpower's gearing which would lead to an over-estimate of Transpower's cost of capital (given the anomaly in the simplified Brennan-Lally CAPM (without debt betas)).

H4 Risk-free Rate

Decision - the risk-free rate

H4.1 In relation to the risk-free rate, the IM specifies:

- the process and methodology for estimating the risk-free rate;
- that the Commission will use the observed market yield to maturity of benchmark NZ government NZ\$ denominated nominal bonds to estimate the risk-free rate;
- that the Commission will estimate the risk-free rate by averaging the observed market yields on the government bonds over one calendar month prior to when the cost of capital is being estimated;
- the term of the risk-free rate will be five years in the case of information disclosure regulation for EDBs, GPBs and Transpower and estimates of the five-year risk-free rate will be updated annually;
- the term of the risk-free rate will match the length of the regulatory period for DPPs (five years), IPPs (for Transpower - five years) and for CPPs (three, four or five years);
- the risk-free rate will not be updated during a DPP/IPP period and the risk-free rate will not be updated once a supplier is on a CPP; and
- that the Commission will update the estimate of the risk-free rate for each cost of capital estimation.

Commission's reasons - the risk-free rate

Overview

H4.2 The risk-free rate is the interest rate that an investor would expect to earn by holding a risk-free asset. The Commission uses the risk-free rate when estimating both the cost of debt and the cost of equity.

H4.3 In practice, the risk-free rate cannot be observed; it is usually approximated by the return on a very safe asset such as a government bond. When selecting the risk-free rate, the first step is therefore to identify a suitable proxy. Depending on the proxy chosen, the second step is to decide whether to use the current risk-free rate or an historical average of the risk-free rate. The third step is to decide whether to use spot rates or yields to maturity. The fourth step is to determine the timing and period of estimation from the proxy. The final step is to determine the appropriate maturity of the rate. Each of these issues is discussed in turn below.

Commission's reasons - suitable proxy for the risk-free rate

H4.4 The Commission considers that a good risk-free proxy should be (i) virtually free of risk, (ii) liquid, (iii) free of restrictions on trade, and (iv) not have characteristics other than its returns distribution that attracts or discourages investors.

- H4.5 The Commission and most other regulators have traditionally employed their respective government's local currency denominated bonds as the relevant proxy for the risk-free rate. However, it has been argued before the Commission and some overseas regulators that because of the low supply of government bonds at that time, a more appropriate benchmark is the yield on interest rate swaps (swap rate).⁹⁴⁰ This was motivated by a widening of spreads between government securities and swap rate, across maturities.⁹⁴¹ However, this effect has diminished as a result of increased availability of government bonds after the recent GFC.
- H4.6 Submitters generally agreed that the most suitable proxy for the risk-free rate in New Zealand continues to be the New Zealand government bond rate.⁹⁴² However, some submitters have suggested that the Commission should continue to review the use of government bonds in preference to swaps for estimating the risk-free rate.⁹⁴³
- H4.7 PwC (for ENA) noted that the swap rate may not be totally risk free as it may still incorporate a premium (albeit, typically small) for the default risk of the banks active in this market, who are the swap counterparties. PwC considered a possible approach to address this point was to use the price of credit default swaps for those banks as a deduction from the swap rate in order to derive a "pure" risk free rate.⁹⁴⁴

Conclusion - suitable proxy for the risk-free rate

H4.8 The Commission considers that benchmark New Zealand government bonds best fulfil the conditions at paragraph H4.4. With regard to swap rates, the Commission notes that:

- swap rates appear to be widely used by practitioners as benchmarks for some purposes but that does not necessarily imply that they are a good proxy for the risk-free rate;
- the conditions that originally motivated the suggestion to use swap rates (low supply of government bonds) no longer apply;

⁹⁴⁰ An interest rate swap is an agreement between two parties to exchange one stream of interest payments for another. The most common type of interest rate swap exchanges fixed interest rate payments for floating interest rate payments for a given principal amount and period of time. The floating rate in such contracts is often based on interbank offer rates (e.g. LIBOR). Swap rates are quoted in terms of the fixed rate that must be paid in order to convert to floating (Fleming, M. J., *Financial Market Implications of the Federal Debt Paydown*, Brookings Papers on Economic Activity, Vol. 2, 2000, pp. 221–251).

⁹⁴¹ An undersupply of government securities can occur when, for example, large fiscal surpluses prompt governments to retire existing debt and issue new debt more slowly.

⁹⁴² Commerce Commission, *Cost of Capital Workshop Transcript*, pp. 136-141.

⁹⁴³ PricewaterhouseCoopers, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, p. 8; Electricity Networks Association, *Cross Submission on the Cost of Capital Workshop*, 2 December 2009, p. 9; Telecom Limited, *Post-workshop Submission on the Cost of Capital*, Attachment: PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, 2 December 2009, p. 12; Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, p. 20.

⁹⁴⁴ Electricity Networks Association, *Submission on EDBs (Input Methodology) Draft Determination and Reasons Paper*, PricewaterhouseCoopers *Submission on the Cost of Capital Parameter Estimates*, 13 August 2010, p. 20.

- the notion that swap rates should replace government bond yields as the risk-free proxy has not achieved widespread consensus in academia, and therefore does not appear to support the use of swap rates as the risk-free rate in CAPM calculations;⁹⁴⁵
- the Commission is not aware of any regulator that has employed swap rates in place of yields on government securities as a proxy for the risk-free rate; and
- for the Commission to adopt the swap rate as the basis for its risk-free rate, it would need to be satisfied that there is a long-term trend indicating that the swap rate is a better proxy for the risk-free rate than the government bond rate. The Commission considers that, currently, there is no such trend.

H4.9 For these reasons, the Commission considers that benchmark New Zealand government bonds are the better suited proxy for the risk-free rate.

Commission's reasons - historical or current risk-free rates

H4.10 The risk-free rate can be estimated by reference to average historical interest rates (for example, the last ten years to proxy the long-term average risk free rate); or current interest rates (for example, based on rates around the time the cost of capital is determined for each regulatory period). Regulators in the UK generally use approaches which reflect long-term historical average risk-free rates.⁹⁴⁶ The Commission and the Australian regulators generally use current interest rates in regulatory determinations.

H4.11 Using historical rates reflects long-term average actual risk-free rates and will lead to estimated costs of equity and debt which tend to be relatively stable over time. In a price setting context, this relative stability will tend to lead to relatively stable returns to suppliers and prices to consumers over time. However, this apparent stability could blunt the signals from structural changes in the financial markets with respect to new investment in infrastructure, as significant changes in interest rates only slowly affect the specified cost of capital.

H4.12 The use of current rates will lead to estimated costs of equity and debt which more closely reflect changes in expectations in the financial markets.⁹⁴⁷ That is, they are more up-to-date estimates of interest rates and therefore the cost of capital. In a price setting context, using current rates means changes in expectations in the financial markets will be signalled more rapidly to suppliers, and to consumers.

Conclusion – historical or current risk-free rates

H4.13 The Commission considers that the use of current rates better achieves the Part 4 Purpose (of promoting the long-term benefit of consumers such that suppliers have,

⁹⁴⁵ Hull, J., Predescu, M., White, A., The Relationship between Credit Default Swaps Spreads, Bond Yields and Credit Rating Announcements, *Journal of Banking and Finance*, Vol. 28, 2004, pp. 2789-2811.

⁹⁴⁶ For example Ofcom based the risk-free rate on a five year average rate with analysis undertaken for periods using six months up to five years. Ofcom, *A new pricing Framework for Openreach, Annexes*, 22 May 2009, p. 168-169.

⁹⁴⁷ See the research by Forsyth Barr, which illustrates how the WACC estimated under the IM will change to reflect changes in interest rates over time (discussed at paragraph H13.56 on page 591 below). Specifically, Forsyth Barr estimate that Transpower's future WACC (under the draft IM) will be higher when interest rates increase from their current lows.

among other things, incentives to invest) and the potential dynamic efficiency benefits of investment, than the use of historic rates.

Commission's reasons - yield to maturity versus spot rates

H4.14 The Commission typically uses yields to maturity⁹⁴⁸ on benchmark New Zealand government bonds as the proxy for the risk-free rate in the CAPM.⁹⁴⁹ However, the theoretically correct approach would to use spot rates (sometimes referred to as zero coupon rates) instead, i.e. the rates that would apply to a bond that delivers a single payoff at maturity.

H4.15 If yields to maturity on coupon paying bonds are used in place of spot rates, the resulting estimates of the cost of capital will be biased downward or upward depending on whether the yield curve is upward or downward sloping. Such inaccuracies are likely to be greatest for low-risk investments because the NPV⁹⁵⁰ of such investments is more sensitive to changes in the risk-free rate than for risky projects, which will have a larger risk premium.

H4.16 In a submission on the RDG PwC (for 17 EDB's) argued that:⁹⁵¹

Using spot rates on government bonds as the risk-free rate in the CAPM is the theoretically preferred approach. However, we agree that in many circumstances, for pragmatic reasons, including obtaining data and the preference for the use of a single rate, using yields to maturity would be an appropriate approach.

H4.17 In all previous decisions and determinations using the cost of capital, the Commission has estimated the risk-free rate using the yield to maturity on New Zealand Government bonds. Australian and UK regulators also estimate the risk-free rate using the yields of their respective governments' bonds.

H4.18 In advice to the Commission, the Expert Panel recommended that the Commission employ yields to maturity as an approximation to represent the risk-free rate (as it presently does), but use spot rates as a cross-check. Dr Lally accepted that the risk-free rate should have a duration, rather than a term, equal to that of the regulatory cash flows, but he argued that the effect of using terms rather than durations is slight.⁹⁵²

Conclusion - yield to maturity versus spot rates

H4.19 The Commission acknowledges that, in theory, it should use spot rates to estimate the risk-free rate, rather than yields to maturity. However, yields to maturity are more readily obtainable than spot rates (most practitioners rely on financial institutions to estimate the spot rates), and using a single interest rate in the estimation process simplifies the necessary calculations.

⁹⁴⁸ A bond's yield to maturity, also known as its internal rate of return, is the discount rate that sets the price of the bond equal to the discounted value of the promised future payments on the bond.

⁹⁴⁹ Benchmark New Zealand government bonds usually pay coupons every six months.

⁹⁵⁰ NPV refers to the present value of future cash flow less the initial investment.

⁹⁵¹ PricewaterhouseCoopers, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, p. 8.

⁹⁵² Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, Report prepared for the Commerce Commission, 18 December 2008, pp. 17-18.

H4.20 For this reason, the Commission will use yields to maturity when estimating the cost of capital. The Commission notes that in consultation on the cost of capital a number of interested parties acknowledged that they use and would advise the Commission to use yields to maturity when estimating the cost of capital.

Commission's reasons - averaging period

H4.21 The Commission is aware that market volatility can significantly increase at any time and, thus, of the effect that an event such as the GFC can have. Therefore, the Commission needs to balance the need to obtain a current market estimate, with the desire that the estimate be representative of its level more generally.

H4.22 In the Airports Inquiry, the risk-free rate was estimated by averaging the yields on New Zealand government bonds over the period in which Airports consulted with their substantial customers. The period used by the Commission was six months.⁹⁵³

H4.23 In all TSO net cost calculation determinations, the Gas Control Inquiry, Electricity Distribution – Control of Unison and the Gas Authorisation, the Commission estimated the risk-free rate by averaging the yields on New Zealand government bonds one month before the start of a regulatory period.⁹⁵⁴

H4.24 The Australian Energy Regulator's (AER) approach to the averaging period is to allow the regulated businesses discretion to choose the length of the averaging period within the span of 10 to 40 business days. In the opinion of the AER, the range of 10 to 40 business days represented an optimal length of time to balance the trade-off between 'volatility driven error' and 'old information driven error'. Other Australian regulators use a similar approach.

H4.25 In advice to the Commission in the Electricity Distribution – Control of Unison, the Gas Control Inquiry and the Gas Authorisation, Dr Lally indicated that he favoured averaging the risk-free rate over the preceding month before the start of the regulatory/disclosure period. Dr Lally stated that the reason for this position was:⁹⁵⁵

... the data should be current but the use of the rate on a single day (or less) yields exposure to a 'freakish' rate, due to the volumes of trades or to trades motivated by particularly strong incentives to transact.

H4.26 At the Cost of Capital Workshop parties agreed that taking a one-month average of the adjusted yields on New Zealand government bonds was appropriate in estimating the risk-free rate.⁹⁵⁶

⁹⁵³ Commerce Commission, *Part IV Inquiry into Airfield Activities at Auckland, Wellington and Christchurch International Airports, Final report*, 2002, pp. 150-151.

⁹⁵⁴ Commerce Commission, *Gas Control Inquiry, Final Report*, 28 November 2004; Commerce Commission, *Regulation of Electricity Lines Businesses Target Control Regime Reasons for Not Declaring Control Unison Networks Limited*, 11 May 2007; Commerce Commission, *Gas Authorisation Decision Paper*, 30 October 2008.

⁹⁵⁵ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, paper prepared for the Commerce Commission, 24 November 2004, p. 27; Lally, M., *The weighted average cost of capital for electricity lines businesses*, paper prepared for the Commerce Commission, 8 September 2005, p. 29; Lally, M., *The weighted average cost of capital for gas pipeline businesses*, paper prepared for the Commerce Commission, October 2008, p. 38.

⁹⁵⁶ Commerce Commission, *Cost of Capital Workshop Transcript*, pp. 136-141.

Conclusion - averaging period

H4.27 As discussed above, the Commission needs to balance the need to obtain a current market estimate of the risk-free rate, with the desire that the estimate of the risk-free rate be representative of its level more generally. The Commission considers that a one calendar month averaging period strikes an appropriate balance as it reduces the degree of volatility while still providing a relatively up-to-date estimate of the risk-free rate.

Commission's reasons - updating the risk-free rate

H4.28 As outlined above, the risk-free rate is subject to volatility. This volatility was particularly pronounced during the recent GFC. Therefore, the Commission will update its estimate of this parameter every time it estimates the cost of capital for regulatory purposes. However, once a supplier is on a DPP or CPP the cost of capital estimate used in the determination of the price path will remain unchanged.

Commission's reasons - the appropriate term of the risk-free rate

H4.29 The term of the risk-free rate should ensure the resulting estimate of the cost of capital is estimated with a term that is consistent with the period of the regulatory instrument (for example, the DPP or CPP) in which it will be applied. For most applications, this means a term of five years, though a three year or four year term will be required where a CPP applicant seeks a three or four year CPP.

Previous decisions

H4.30 In previous decisions, the Commission has always matched the term of the risk-free rate to the period for which prices are set or price reset (referred to as the regulatory period). The regulatory periods ranged from one year (the TSO net cost calculation) to seven years for the Gas Authorisation.⁹⁵⁷ In the case of the Airports Inquiry, the Commission considered the term of the risk-free rate should be set at five years as this was the period that Airports typically set their prices for.⁹⁵⁸ The term of the risk free rate needs to match the regulatory period to ensure the supplier of the regulated service only earns a normal rate of return.

Matching the term of the risk-free rate to the regulatory period to ensure a normal rate of return

H4.31 A fundamental concept in finance is that the interest rate applied to a set of cash flows should reflect the risk, and the term, of those cash flows. To illustrate, consider the pricing of a zero-coupon five year bond. The only discount rate that will correctly price this bond is the five year spot rate. Applying an interest rate with a term other than five years would generate either windfall gains or losses to the holder of the bond by mispricing it. The precise outcome will depend on the slope of the term structure of interest rates.

⁹⁵⁷ Commerce Commission, *Determination for TSO Instrument for Local Residential Service for period between 20 December 2001 and 30 June 2002*, 17 December 2003, and every year with the latest being the Commerce Commission, *Draft TSO Cost Calculation Determination for TSO Instrument for Local Residential Telephone Service for period between 1 July 2008 and 30 June 2009*, 4 December 2009 and Commerce Commission, *Gas Authorisation Decision Paper*, 2008, pp. 163-165.

⁹⁵⁸ Commerce Commission, *Part IV Inquiry into Airfield Activities at Auckland, Wellington and Christchurch International Airports, Final report*, 2002, pp. 150-151.

- H4.32 In the regulatory context, the Commission will typically be setting suppliers of regulated services' prices or evaluating returns over a given horizon — the regulatory period. Matching the term of the risk-free rate to the term of the regulatory period ensures there is no expectation that regulated suppliers will earn profits that are greater (or lower) than a normal rate of return.⁹⁵⁹
- H4.33 The risk-free rate may either increase with term or decrease with term. When the risk-free rate declines with term, there is said to be an 'inverse yield curve'. That is, long term interest rates are lower than short term interest rates. New Zealand has had an inverse yield curve for significant periods in the past. At present New Zealand has a 'positive yield curve'. That is, Government stock with a longer term has a higher rate of interest than Government stock with a shorter term (for example, 10 years versus five years). Higher long term rates may be due to the uncertainty about future short term rates, an expectation that future rates will rise and the uncertainty about future inflation, which is greater for long-term bonds.
- H4.34 Setting the risk-free rate to a term longer (or shorter) than the regulatory period may provide gains or losses depending on the term structure of interest rates. With a positive yield curve, (as New Zealand currently has) it is in the interests of suppliers for the cost of capital to be based on a longer term rate, but the opposite would be the case when there is an inverse yield curve.

Expert panel

- H4.35 In advice to the Commission on the appropriate cost of capital the Expert Panel had different views about how the term of the risk-free rate should match the regulatory period. The Expert Panel made the following recommendations on the term of the risk-free rate:⁹⁶⁰
- Dr Lally recommended the Commission retain its current practice of setting the intercept term in the CAPM equal to the current risk-free rate whose maturity matches the length of the regulatory cycle.
 - Professor Myers recommended using a L-year forecast of the one-year risk-free rate as the intercept term of the CAPM, standardising on $L = 5$ years. If standardisation is rejected, L should match the length of the regulatory cycle.
 - Professor Franks agreed with Professor Myers' recommendation. Professor Franks suggested that the Commission could standardise on $L = 3$ if regulatory cycles in New Zealand are typically three years.
- H4.36 In previous advice to the Commission on estimating the cost of capital Dr Lally has advised the Commission to set the term of the risk-free rate, in the cost of debt and first term of the CAPM, equal to the price setting period (i.e. regulatory period).⁹⁶¹

⁹⁵⁹ Lally, M., Regulation and the choice of the risk free rate, *Accounting Research Journal*, 2004, Vol. 17 (1), pp. 18-23.

⁹⁶⁰ Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, Report prepared for the Commerce Commission, 18 December 2008, pp. 13-17.

⁹⁶¹ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, paper prepared for the Commerce Commission, 24 November 2004; Lally, M., *The weighted average cost of capital for electricity lines businesses*, paper prepared for the Commerce Commission, September 2005; Lally, M., *The weighted average cost of capital for gas*

Submissions

H4.37 In consultation, a number of suppliers of regulated services disagreed that the term of the risk-free rate should match the regulatory period.⁹⁶² These parties argued that

pipeline businesses, paper prepared for the Commerce Commission, October 2008; Lally, M., The cost of capital for the airfield activities of New Zealand's international airports, 2001.

⁹⁶² NZ Airports, *Submission by NZ Airports Association on the Commerce Commission Input Methodologies Discussion Paper*, 31 July 2009, p. 49; Auckland International Airport Limited, *Submission to the Commerce Commission Draft WACC Guidelines Paper*, 31 July 2009, p. 1; Christchurch International Airport Limited, *CIAL Submission on the Revised Draft Cost of Capital Guidelines*, 3 August 2009, p. 2; Christchurch International Airport Limited, *Submission on Commerce Commission Input Methodologies Discussion Paper*, 7 August 2009, p. 27; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report for NZAA, 31 July 2009, p.27; Maui Development Limited, *Submission to the Commerce Commission on the Input Methodology Discussion Paper*, July 2009, pp. 17-18; Orion, *Submission on Input Methodologies Discussion Paper*, 14 August 2009, p. 29; Powerco Limited, *Input Methodologies Discussion Paper*, 14 August 2009, p. 28; PricewaterhouseCooper, *Revised Draft Guidelines - Submission to Commerce Commission*, Report on behalf of Powerco, August 2009, p. 11; Powerco Limited, *Submission on the Input Methodologies Discussion Paper, Attachment: PricewaterhouseCoopers, Commerce Commission's Revised Draft Guidelines and aspects of the Input Methodologies Discussion Paper relating to Cost of Capital prepared for Powerco Limited*, 14 August 2009, p. 8; PowerNet, *Submission of PowerNet to the Commerce Commission on the Input Methodologies as part of the Implementation of Part 4 of the Commerce Act*, 14 August 2009, p. 4; Telecom, Annex B: *Submission on Commerce Commission Revised Draft Guidelines for estimating the Cost of Capital*, August 2009; Transpower, *Submission to the Commerce Commission on: Transpower Process and Recommendation Discussion paper, Input Methodologies Discussion Paper*, August 2009, pp. 23-24; Unison Networks Limited, *Submission on the Input Methodologies Discussion Paper, Attachment: Castalia Strategic Advisors, Submission on Input Methodologies: Regulatory Cost of Capital: a report prepared for Unison Limited*, 13 August 2009, pp. 5-6; Vector Limited, *Submission on the Input Methodologies Discussion Paper, Attachment: Synergies Economic Consulting, Initial Weighted Average Cost of Capital Review: prepared for Vector Limited*, 13 August 2009, pp. 15-16; Synergies Economic Consulting, *WACC Review: Final*, Report on behalf of Vector Ltd, 31 August 2009, p. 17; Unison, Appendix: *Submission on Revised Draft Guidelines: The Commerce Commission's Approach to Estimating the Cost of Capital*, 14 August 2009, p. 6; Auckland Energy Consumer Trust, *Cross Submission to the Commerce Commission on Cost of Capital Workshop*, 2 December 2009, p. 20; Castalia Strategic Advisors, *Commerce Commission – Cost of Capital – Cross Submission on Behalf of Transpower*, 2 December 2009, pp. 3-4; Electricity Networks Association, *Cross Submission on the Cost of Capital Workshop*, 2 December 2009, p. 9-11; Maui Development Limited, *Cost of Capital Workshop 12th-13th November 2009 – Cross-submission*, 2 December 2009, pp. 7-8; PricewaterhouseCooper, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, Report for 17 EDBs, 2 December 2009, p. 11; Telecom Limited, *Post-workshop Submission on the Cost of Capital*, Attachment: PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, 2 December 2009, p. 12; Synergies Economic Consulting, *Cost of Capital Cross Submission*, Report on behalf of Vector, 2 December 2009, pp. 11-13; Telecom, *Cost of Capital Guidelines – Post-Workshop Submission*, 2 December 2009 p. 3; Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital*, Report on Behalf of NZAA, 2 December 2009, pp. 24-27; Unison, *Post-Conference Submission on the Weighted Average Cost of Capital*, 2 December 2009, Section 3; Vector, *Cross Submission to the Commerce Commission on the Weighted Average Cost of Capital Workshop*, 2 December 2009, pp. 9-10; Christchurch International Airport Ltd., *Submission on Input Methodologies and Information Disclosure Draft Determinations and Reasons Papers for Airport Services*, 12 July 2010, p. 42; NZ Airports Association, *Submission on Draft Information Disclosure Determination and Draft Reasons Paper*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper - Report for NZAA*, 12 July 2010, pp. 25-26; NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, Attachment: Uniservices, *Comments on Air New Zealand's and Board of Airline Representatives New Zealand Incorporated's Submissions to the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper: report prepared for New Zealand Airports Association*, 3 August 2010; p. 11; NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p. 39; Auckland International Airport Limited, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p. 12; Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, pp. 24-25; Powerco Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, pp. 11-15; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, pp. 11-13; Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, pp. 8-11; Unison

the risk-free rate with the longest maturities available in New Zealand – 10 years – should be used. In support of this, suppliers cited:

- Mitigation of re-financing risk;
- The matching principle. Firms that are required to finance assets with expected lives greater than a regulatory review period will seek to borrow term debt with a maturity greater than a typical regulatory review period;
- Normal commercial practice where firms issue a portion of their debt for a longer term; and
- Mitigation of regulatory risk.⁹⁶³

H4.38 Therefore, according to submissions from suppliers, the term of the risk-free rate and debt premium which matches the regulatory period is too short and would under compensate suppliers. However, these submissions overlook: (i) the ability of regulated suppliers to reset prices at the end of the regulatory period to compensate for changes in risk-free rates; and (ii) the widespread use of interest rate swaps. These are now discussed.

The power to reset prices

H4.39 The interest rate on Government stock generally increases with term. Higher long term rates may be due to the uncertainty about future short term rates, an expectation that future rates will rise and the uncertainty about future inflation, which is greater for long-term bonds.

H4.40 Regulated suppliers can reset their prices at the end of each regulatory period to reflect, among other things, changes in the risk-free rate if this has altered the cost of capital. Through the regular resetting of prices the premium for uncertainty over the level of long-term interest rates is being borne by users, rather than suppliers. Accordingly, suppliers' prices should not reflect a premium for the uncertainty of risk-free rates beyond the length of the regulatory period.

The availability of interest rate swaps

H4.41 The Commission notes that firms have a mix of debt maturities to manage refinancing risk, including long term debt. This spreads a firm's re-financing

Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Asia-Pacific Risk Management Limited, *Commerce Commission Cost of Debt Funding Submission Report: prepared for Unison Networks Limited*, 12 August 2010, pp. 11-35; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, 13 August 2010, pp. 20-22; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 51-60; Prime Infrastructure, *Submission on EDBs (Input Methodology) Reasons Paper, Cost of Capital - The Investor Perspective*, 13 August 2010, p. 10.

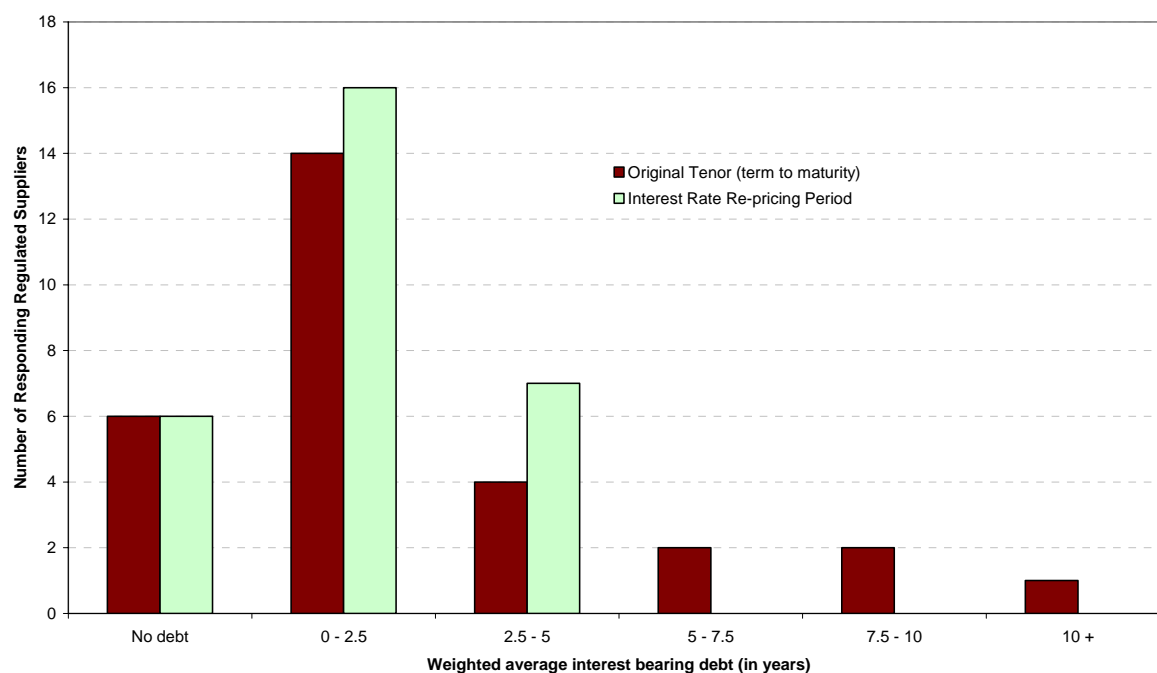
⁹⁶³ Uniservices (for NZAA) considered that suppliers subject to regulation have the potential for risk associated with changes in the regulatory framework over time. In the presence of regulatory risk Uniservices submitted that suppliers would source debt financing that matches their assets life and not the regulatory period to ensure a supplier maintains a prudent commercial treasury policy. See NZ Airports Association, *Cross-submission on the Cost of Capital Conference*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital - Report for NZAA*, 2 December 2009, p. 25.

requirements and reduces the amount of debt that needs to be refinanced in any one year. Reducing re-financing risks has benefits for consumers, but long-term debt typically has a greater cost (specifically a greater debt premium) than medium or short term debt.

- H4.42 The use of fixed rate long-term debt to manage refinancing risk also fixes a firm's interest rate for the term of the loan.⁹⁶⁴ But many firms want to manage their interest rate risk, often for shorter terms than the term of the loan. Therefore the firm enters into an interest rate swap, typically at the same time as the debt finance is raised, to shorten the period for which their interest rate is fixed. This can result in a lower rate of interest. Indeed, it may result in a much shorter interest rate re-pricing period.
- H4.43 In other words, firms are able to use interest rate swaps to re-price their interest costs (earlier than the maturity date of their debt) and lower their overall interest cost. Through the use of interest rate swaps firms can enjoy the benefits of long-term debt (secured funding and reduced refinancing risk) without having to pay the full cost of long term debt finance.
- H4.44 Interest rate swaps are used to hedge the risk-free rate component of their debt portfolios. This leaves the debt premium component matched to the term to maturity that the debt was originally issued for. Interest rate swaps are widely used in this way. This was evidenced in the information on debt profiles that the Commission obtained from regulated suppliers in 2010. Specifically, this showed that the interest rate re-pricing period was shorter than the average term to maturity of the debt portfolio. That is, firms were using interest rate swaps extensively. Many had an interest rate re-pricing period that was less than five-years, with the weighted average interest rate re-pricing period being 3.3 years in 2010, which is much shorter than the term of the regulatory period. Transpower explained at the Cost of Capital workshop that its target interest rate re-pricing period was 2 years.
- H4.45 Figure H3 compares the weighted average original term to maturity for regulated suppliers' debt with the weighted average interest rate re-pricing period for that debt portfolio reported to the Commission by suppliers in 2010. The chart shows that five firms have a debt portfolio with a weighted average tenor (original maturity) greater than five years, and of these three firms had a weighted average tenor greater than 7.5 years, but that after accounting for interest rate swaps, no firm had an average interest rate re-pricing period which was greater than five years. Through the use of interest rate swaps, suppliers can choose their interest rate re-pricing period, and this decision is independent of the original maturity of the debt.

⁹⁶⁴ A small number of New Zealand firms have issued bonds with floating rates of interest.

Figure H3 Regulated suppliers' debt portfolios: Weighted average original term to maturity vs. weighted average interest rate re-pricing period (2010)



H4.46 The data on the actual interest rate re-pricing faced by regulated suppliers illustrate regulated suppliers' ability to use swaps to alter their interest rate re-pricing period, and to set it to a term consistent with or shorter than the regulatory period. As such, it is inappropriate to set the term of the risk-free rate longer than the term of the regulatory period (and it should not be set at 10 years). That is, doing so would (assuming a positive yield curve) over-compensate suppliers as they would receive a (higher) risk-free rate in their regulatory cost of capital when their actual interest costs have been re-priced to a much shorter term (lower rate) by the use of interest rate swaps.⁹⁶⁵

H4.47 The widespread availability and use of interest rate swaps means the term of the risk-free rate should not exceed the term of the regulatory period (and should not be set at 10 years).

H4.48 In support of the longer period for the risk-free rate, Castalia (for Unison), argued that refinancing risk is real for suppliers and this risk is not considered in any way in the CAPM framework. Therefore, in Castalia's view, the use of a term for the risk-free rate to match the regulatory period, clearly breaches the principle of suppliers expecting to earn at least a normal return as it under-compensates prudent and efficient regulated businesses.⁹⁶⁶ The Commission notes that as regulated suppliers can use interest rate swaps to hedge the risk-free rate, this is however an argument

⁹⁶⁵ The cost of executing an interest rate swap is included in the term credit spread differential allowance in respect of suppliers which issue long-term debt (see section E6).

⁹⁶⁶ Unison Networks Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: Castalia Strategic Advisors, *Submission on Input Methodologies: Regulatory Cost of Capital: a report prepared for Unison Limited*, 13 August 2009, pp. 3-6.

regarding the term for the debt premium (which cannot be hedged in the same way) rather than an argument relevant to the term of the risk-free rate per se.

- H4.49 The Commission accepts that use of a term for the debt premium which matches the regulatory period may under-compensate those suppliers which on average borrow for a term to maturity which exceeds the length of the regulatory period, as the supplier cannot hedge the greater debt premium. To recognise the greater debt premium on long maturity debt (where it is actually incurred by a supplier), the cost of capital IM includes an allowance for the costs incurred by firms in issuing longer-term debt to manage their re-financing risks. This is discussed in section H5 on the debt premium and section H6 on the term credit spread differential.
- H4.50 The Commission notes the arguments made by suppliers in support of a 10 year term that it is normal commercial practice to match funding to asset lives to the extent possible. The Commission has surveyed regulated suppliers on their debt portfolios. These surveys, undertaken in 2009 and 2010, showed that the majority of regulated suppliers that are subject to Part 4 only issue debt for periods of up to five years (see Section H5 on the debt premium for a more detailed analysis). Thus, actual behaviour is not consistent with the claim.
- H4.51 The Commission notes that a number of monopoly suppliers use a term for the risk-free rate which matches the pricing period, when estimating their cost of capital. This is so even where the supplier is free to determine its own prices. For example, Airways Corporation uses a five year risk-free rate for its estimate of its cost of capital⁹⁶⁷ and a number of airports (e.g. Hamilton, AIAL, CIAL⁹⁶⁸) adopt a five year term for the risk-free rate in their estimates of the cost of capital, which corresponds with the length of their pricing agreements.

Conclusion - the appropriate term of the risk-free rate

- H4.52 The period of focus for regulatory purposes is the regulatory period, which is generally five years, not the life of the asset or business. Setting the term of the risk-free rate equal to the term of the regulatory period ensures that regulated suppliers are compensated for the risk they are exposed to during the regulatory period and that regulated suppliers are able to have the expectation of earning a normal return in the long-run. The regulated supplier also knows what the risk-free rate is for the duration of the regulatory period and can plan and manage its business accordingly.
- H4.53 Setting the term of the risk-free rate at 10 years, when there is an inverse yield curve, would under-compensate suppliers. Conversely, when there is a positive yield curve, a 10 year term of the risk-free rate would over-compensate suppliers.
- H4.54 When suppliers reset their prices at the end of each regulatory period to reflect changes in WACC including changes in interest rate, the premium for uncertainty in long-term risk-free rates is borne by consumers, not suppliers. The use of a risk-free

⁹⁶⁷ Airways Corporation, *Pricing Proposal 2009/10 Air Navigation Service Charges for Aircraft 5 Tonnes and under Supporting Information Pack*, p. 2. Airways Corporation, *Statement of Corporate Intent 2010/11 – 2012/13*, p. 11.

⁹⁶⁸ Hamilton International Airport, *Landing Charges Pricing Methodology*, March 2008, p. 15. Auckland International Airport Limited, *Identified Airport Activities Disclosure Financial Statements for the year ended 30 June 2009*, p. 42. Christchurch International Airport Limited, *Disclosure Financial Statements for the year ended 30 June 2009*, p. 42.

rate with a term longer than the pricing period would compensate suppliers for an uncertainty they do not bear.

- H4.55 New Zealand suppliers make widespread use of interest rate swaps to manage interest rate risk. As suppliers can and do shorten the interest rate re-pricing period through the use of interest rate swaps, the term of the risk-free rate should not be based on a 10 year term.
- H4.56 The term credit spread differential has been included in the cost of capital IM to recognise and compensate for the greater debt premium some regulated suppliers may actually incur on their debt portfolio. Regulated suppliers will qualify for this allowance where their average debt tenor (and therefore debt premium) is more than five-years.
- H4.57 In the context of information disclosure regulation, the IM specifies a five-year term when estimating the risk-free rate. The estimate will be updated annually.
- H4.58 In relation to default/customised price-quality regulation, the Commission considers that it is appropriate to adopt a risk-free rate that is aligned with the regulatory period. This estimate will apply for the entire period and will not be updated during the regulatory period. Hence, for the DPP, which has a regulatory period of five years, the risk-free rate will be based on a five-year estimate. As the regulated supplier that opts for a CPP can take either a three, four or five-year term, the estimated risk-free rate will correspond to the CPP term chosen by the regulated supplier.
- H4.59 As the Commission can receive CPP applications each year, the risk-free rates for the three, four and five-year CPP will be estimated annually. Once a supplier is on a CPP, the risk-free rate will not be updated during the regulatory period.

H5 Debt Premium and Debt Issuance Costs

Decision - debt premium and debt issuance costs

- H5.1 The debt premium is the additional interest rate, over and above the risk-free rate, required by suppliers of debt capital to compensate them for being exposed to the risks of default in lending to a firm plus an allowance for the inferior liquidity of corporate bonds relative to government bonds. In general, the longer the firm wishes to borrow the debt for, the higher the debt premium that the firm has to pay to the suppliers of debt capital.
- H5.2 The Commission estimates the debt premium as an intermediate step towards estimating the cost of debt, which forms a component in estimating the cost of capital.
- H5.3 The IM specifies a service-specific (as opposed to a supplier-specific) debt premium as the difference between the corporate borrowing rate and the risk-free rate. As with the risk-free rate, the Commission proposes to update the estimate of the debt premium for each cost of capital estimation.

H5.4 In relation to the debt premium for EDBs, GPBs and Transpower, the IM provides that:

- the term of the debt premium will be the same as the term used for the risk-free rate;
- the debt premium will be estimated by taking account of the average debt premium that would reasonably be expected to apply to publicly traded vanilla New Zealand dollar denominated corporate bonds that are issued by an EDB or GPB that is neither majority owned by the government nor a local authority, with a Standard and Poors (S&P) long-term credit rating of BBB+, or equivalent rating from Moody's or Fitch;
- to address the small number of bonds with a S&P long-term credit rating of BBB+ that are publicly traded in New Zealand, this may involve, as required, progressively expanding the range of publicly traded bonds considered to include:
 - those which are not issued by an EDB or GPB;
 - those with a S&P long-term credit rating other than BBB+; and
 - those issued by an entity majority owned by the government or a local authority;

but in each case adjusting the observed debt premium to approximate the debt premium that is likely to have been observed had the bond been of the type first described;

- the risk-free rate will be estimated using New Zealand government New Zealand dollar denominated bonds (refer Section H4);
- for information disclosure regulation, as was the case for the risk-free rate, the five-year estimate of the debt premium will be updated annually;
- the term of the debt premium will match the length of the regulatory period in the case of default/customised price-quality regulation;
- for default/customised/individual price-quality regulation, as with the risk-free rate, the debt premium will be estimated prior to each regulatory period;
- for the application as part of a CPP the debt premium will be estimated for a three, four and five-year period;
- for default/customised/individual price-quality regulation, the estimate of the debt premium will be updated for each cost of capital estimation but the debt premium will not be updated once a supplier is on a DPP, CPP or IPP; and
- as with the risk-free rate, the Commission will estimate the debt premium by averaging the debt premium over one calendar month prior to when the cost of capital is being estimated.

- H5.5 Unlike the risk-free rate which can be hedged, the greater debt premium on long term debt cannot be hedged economically. The IM provides an allowance (the term credit spread differential) which compensates for the greater debt premium on long maturity debt where the firm has an average original tenor (time to repayment) which exceeds the regulatory period. As part of this allowance, the IM also compensates a qualifying regulated supplier (that is, a supplier with an average debt tenor which is greater than the regulatory period), for executing an interest rate swap (to hedge the risk-free rate).
- H5.6 The IM provides that debt issuance costs will be included in the cost of capital estimation for EDBs, GPBs and Transpower, as a 35 basis points p.a. (0.35% p.a.) margin to the cost of debt capital, based on amortising the debt issuance costs over the same period as the term of the debt premium, i.e. five years. For CPPs, the allowance for debt issuance costs is recalculated to reflect an assumed debt term of three, four, or five years to match the length of the CPP regulatory period the supplier seeks.

Commission's reasons - debt premium

The term of the debt premium

- H5.7 As with the risk-free rate, the term of the debt premium will match the regulatory period.⁹⁶⁹ This ensures internal consistency.
- H5.8 In previous regulatory decisions, the Commission has generally aligned the term of the corporate rate of borrowing used to measure the debt premium with the term for the risk-free rate.⁹⁷⁰
- H5.9 Some submitters disagreed with the Commission's decision to estimate the debt premium for the same term as the regulatory period. They stated that the debt premium should be measured for the term that is optimal (having regard to cost efficiency, including minimising amortised issuance costs and prudent management of re-financing risk). Submitters considered that prudent firms in a competitive market will match their debt maturities to the life of the assets.⁹⁷¹ Many of these

⁹⁶⁹ Appendix H4 includes further discussion on the risk-free rate.

⁹⁷⁰ The exception to this is the TSO net cost calculation determination for 2006/2007. For a full explanation of the result and reasoning see Commerce Commission, *Final TSO Cost Calculation Determination for TSO Instrument for Local Residential Telephone Service for period between 1 July 2006 and 30 June 2007*, 7 October 2009, pp. 25-40.

⁹⁷¹ Christchurch International Airport Limited, *Submission on the Revised Draft Cost of Capital Guidelines*, 3 August 2009, p. 2; PricewaterhouseCooper, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, p. 13; Powerco Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: PricewaterhouseCoopers, *Commerce Commission's Revised Draft Guidelines and aspects of the Input Methodologies Discussion Paper relating to Cost of Capital prepared for Powerco Limited*, 14 August 2009, pp. 32-34; Telecom, Annex B: *Submission on Commerce Commission Revised Draft Guidelines for estimating the Cost of Capital*, August 2009; Transpower, *Submission to the Commerce Commission on: Transpower Process and Recommendation Discussion paper Input Methodologies Discussion Paper*, August 2009, pp. 25-27; Synergies Economic Consulting, *WACC Review: Final*, Report prepared for Vector, 31 August 2009, pp. 18-24; Unison, *Post-Conference Submission on the Weighted Average Cost of Capital*, 2 December 2009, p. 7; Synergies Economic Consulting, *Cost of Capital Cross Submission*, Report prepared for Vector, 2 December 2009, pp. 11-13; Electricity Networks Association, *Cross Submission on the Cost of Capital Workshop*, 2 December 2009, pp. 9-10; PricewaterhouseCooper, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, Report on Behalf of 17 EDBs, 2 December 2009, p. 12; PricewaterhouseCooper, *Cross Submission on the Commerce Commission's Cost of Capital Workshop*, Report on behalf of Telecom, 2 December 2009, p. 13; Auckland Energy Consumer Trust, *Cross Submission to the Commerce Commission on Cost of Capital Workshop*, 2 December 2009, p. 20; Vector, *Cross Submission to Commerce Commission on the Weighted Average Cost of Capital Workshop*, 2 December 2009, pp. 9-10; Uniservices, *Comments*

submitters recommended that the Commission should assume a 10 year term for estimating the debt premium.

- H5.10 CEG (for Vector) provided evidence from other countries of the original maturity of debt issued by regulated electricity suppliers. Since these suppliers issue debt for periods longer than five years, CEG submitted that the Commission should use a term for the debt premium longer than the regulatory period.⁹⁷²
- H5.11 In 2009 and 2010 the Commission surveyed suppliers of services regulated under Part 4. In 2010 (2009), only five (four) of 29 (31) regulated suppliers which responded to the Commission's request advised that the actual weighted average original period to maturity of their debt was greater than five years - and only one was greater than ten years.⁹⁷³ Their responses are shown in Figure H4. Large suppliers generally issued longer-maturity debt, while (the more numerous) smaller suppliers did not. In the 2010 survey, the value-weighted average original period to maturity of the regulated suppliers who responded was 7.4 years (in 2009 it was 7.3 years).⁹⁷⁴

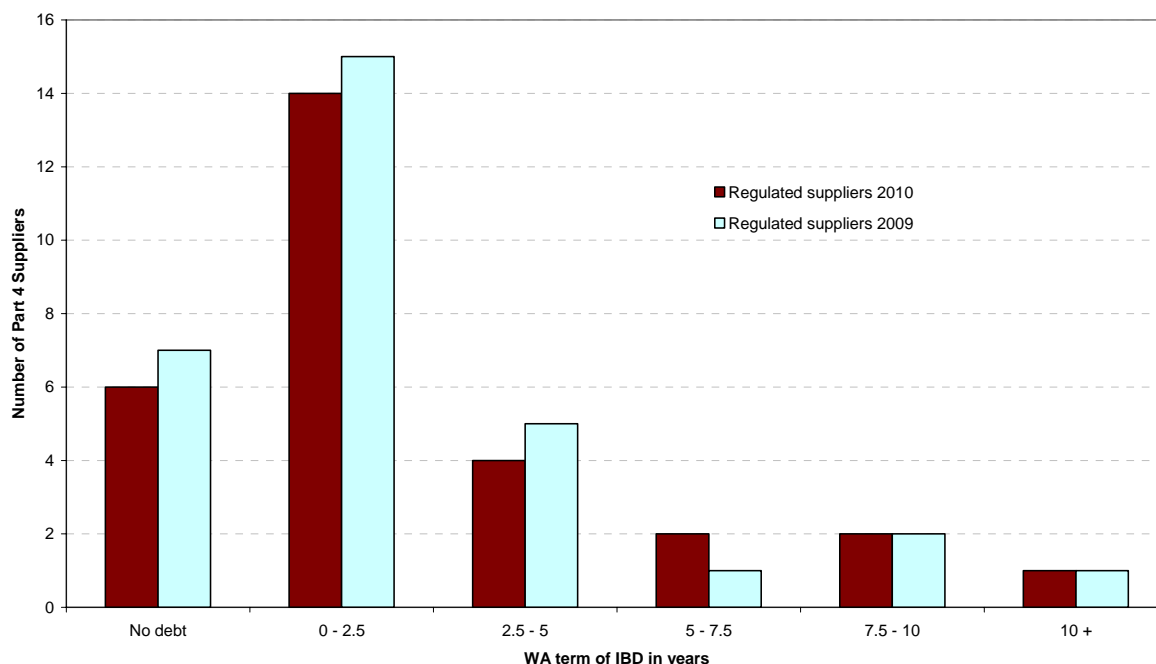
on the Commerce Commission's Approach to estimate the Cost of Capital, Report prepared for NZAA, 2 December 2009, pp. 43-44., Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: PricewaterhouseCoopers, Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, pp. 24-25; Powerco Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, pp. 11-15, paragraphs 30-48; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010 (PWC for 20 EDBs, *Submission on the Draft Cost of Capital for EDBs and GPBs Determinations and Draft Reasons Papers*), pp. 11-13; Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, pp. 8-11; Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: Asia-Pacific Risk Management Limited, Commerce Commission Cost of Debt Funding Submission Report: prepared for Unison Networks Limited*, 12 August 2010, pp. 11-35; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, 13 August 2010, pp. 20-22; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 51-60; Prime Infrastructure, *Submission on EDBs (Input Methodology) Reasons Paper, Cost of Capital - The Investor Perspective*, 13 August 2010, p. 10; Transpower New Zealand Ltd., *Submission on Transpower (Input Methodologies) Draft Reasons Paper, Cost of Capital Decisions*, August 2010, p. 10; Transpower New Zealand Ltd., *Submission on Transpower (Input Methodologies) Draft Reasons Paper and Individual Price-Quality Path*, Attachment: R. R. Officer & S. Bishop - *Independent Review of Commerce Commission's WACC Proposals for Transpower*, 5 August 2010, pp. 11-14.

⁹⁷² Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 51-60.

⁹⁷³ The five suppliers with debt portfolios with an average original tenor exceeding five years comprised two suppliers of airport services, and three suppliers of electricity and/or gas services.

⁹⁷⁴ For suppliers of airports services the weighted average original period was approximately five years in 2009 and 2010. The weighted average original period for suppliers of electricity distribution services was 7.8 years. However, if the suppliers that are also suppliers of gas pipeline services are removed the weighted average original period falls to approximately two years.

Figure H4 Regulated suppliers' debt portfolio: weighted average original term to maturity of interest bearing debt



H5.12 For the majority of regulated suppliers (24 of 29 in 2010; and 27 of 31 in 2009) the weighted average original period to maturity of their debt was five years or less. Therefore, basing the estimation of the debt premium on a 10 year term would overstate the debt premium by compensating them for costs that they do not actually incur.

H5.13 For the 24 (27) regulated suppliers in 2010 (2009) whose weighted average term to maturity was less than five years, a debt premium based on a five year term could be seen as concessional (since, on average, they are paying a debt premium on shorter maturity debt, that is, a lower debt premium). However, it is for each supplier to determine the average tenor of its debt portfolio. The Commission would not want to incentivise firms to increase their refinancing risk by relying more heavily on shorter maturity debt.

H5.14 For the suppliers that have, on average, issued debt with a term to maturity that is longer than the regulatory period (thereby incurring a greater debt premium), the Commission has ensured that they will not be under-compensated as they will qualify for the term credit spread differential allowance. This is discussed in Appendix H6.

Conclusion - term of the debt premium

H5.15 For information disclosure regulation, the IM specifies a five-year term when estimating the debt premium. The Commission will update the estimate of the five-year debt premium on an annual basis.

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- H5.16 In relation to default/customised price-quality regulation, the term of the debt premium will be aligned with the regulatory period (and the risk-free rate).
- H5.17 The DPP has a regulatory period of five years, so the debt premium will be based on a five-year estimate. Once set, the debt premium will not be updated during the DPP regulatory period. As a CPP may apply for a three, four or five-year regulatory period, the debt premium will be estimated annually by the Commission for each of these scenarios. The estimate of the debt premium will correspond to the length of the CPP regulatory period. However, once applied (i.e. the supplier is on a CPP) the debt premium will not be updated during the CPP regulatory period.
- H5.18 At the end of the first DPP or CPP, the regulated supplier will enter into a new DPP or CPP, with a new WACC to be applied. That new WACC incorporates a revised estimate of the debt premium (and the risk-free rate).

Term credit spread differential

- H5.19 Some regulated suppliers issue debt with an original period to maturity greater than five years to manage their exposure to re-financing risk. At the same time such suppliers may also enter into an interest rate swap to shorten the interest rate re-pricing period.
- H5.20 Prudent management of re-financing risk by issuing debt with a long period to maturity is in the long term interests of consumers. Therefore, where a regulated supplier actually issues debt with an original period to maturity greater than five years, and the weighted average original period to maturity of its debt portfolio is also greater than five years, the IM proposes that an allowance for the additional debt premium is appropriate. The allowance relates only to debt issues with an original period to maturity greater than the regulatory period.
- H5.21 Where an issue of debt qualifies for this allowance, to be consistent, the amortisation period applied to the notional debt issuance costs attributed to the issue of debt will be adjusted to reflect the actual original period to maturity. In addition, there is an allowance for the execution costs of an interest rate swap.
- H5.22 A more detailed explanation of the term credit spread differential and how it works is set out in Appendix H6.

Australian 10 year debt premium

- H5.23 A number of submissions referred to the practice of Australian regulators in estimating the debt premium (and the risk-free rate) on a 10 year term and submitted that the IM too should adopt a 10 year term for estimating the debt premium (and the risk-free rate).⁹⁷⁵ The Australian adoption of the 10 year term is often linked to the

⁹⁷⁵ See, for example, Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, p. 19. Prime Infrastructure, *Cost of Capital – The Investor Perspective*, 13 August 2010, p. 10. Wellington Electricity Lines Limited, *Submission to the Commerce Commission on Draft Cost of Capital Input Methodology Decision*, 13 August 2010, p. 12.

Gasnet decision by the Australian Competition Tribunal.⁹⁷⁶ In that case, the regulated firm (Gasnet) submitted an access agreement which used a 10 year risk-free rate to estimate its cost of debt. The regulator (ACCC) rejected that approach, arguing a five year term should be adopted. The issue for the Tribunal was whether the regulator was entitled to reject the firm's rate of return as being inconsistent with the code. The Tribunal decided the firm's use of the 10 year Government bond was permitted under the code and that the regulator was wrong to reject Gasnet's access arrangement.

H5.24 The Gasnet decision did not examine critically whether a 10 year term or a term matching the regulatory period was a better approach to estimating the cost of capital. The issue as to whether or not the use of a 10 year term may overcompensate suppliers was not discussed in the Tribunal's decision.

H5.25 Since around the time of the Gasnet decision, most Australian regulators have adopted a 10 year term for the risk-free rate and debt premium. However, more recently, the use of a 10 year term for estimating the debt premium has been increasingly questioned by Australian regulators and indeed by the Australian Competition Tribunal. For example:

- the AER issued a draft decision paper proposing moving to a five year term, though in its final decision it adopted a "cautious approach" and retained the 10 year term, despite acknowledging that this overstated the cost of debt for suppliers;⁹⁷⁷
- the QCA moved to a five year term (with allowance for additional debt premium on longer maturity debt) in its 2010 decision on QR Networks;⁹⁷⁸
- IPART issued a public discussion document which discusses, among other things, whether to shorten the 10 year term to align with the regulatory period;⁹⁷⁹ and
- the Australian Competition Tribunal, in a September 2010 decision, questioned the continued appropriateness of using 10 year bond yields. The Tribunal's judgment noted that:

There is another point worth noting about the AER's methodology. It arises out of the difficulty in identifying a sufficient number of long term bonds to determine yield. The reasons a 10 year bond was originally chosen was because, in the past, many firms favoured long term debt, albeit that it came at a higher cost, because it reduced refinancing or roll-over risks. The high rate was then hedged via interest rate swaps. That may no longer be the position. If not, the AER may need to reconsider its approach in light of more current strategies of firms in the relevant regulated industry.

⁹⁷⁶ Australian Competition Tribunal, *Application for review of the decision by the Australian Competition and Consumer Commission published on 17 January 2003 in connection with revisions to the access arrangement for the gas transmission system owned by Gasnet Australia (Operations) Pty Ltd*, 23 December 2003.

⁹⁷⁷ AER, *Electricity transmission and distribution network service providers Review of the weighted average cost of capital (WACC) parameters*, May 2009, p. 173.

⁹⁷⁸ QCA, *QR Network's – Tariffs and Schedule F, Draft decision*, June 2010, pp. 33-39. The final decision made no change to the draft decision. See, QCA, *QR Network's 2010 DAU, Final decision*, September 2010.

⁹⁷⁹ IPART, *Developing the approach to estimating the debt margin Other industries – Discussion Paper*, November 2010, Chapter 8, pp. 57-60.

Further, there seems to be little point in attempting to estimate the yield on a bond which is not commonly issued.⁹⁸⁰

H5.26 The Commission notes that these developments suggests the preference for a 10 year term by Australian regulators may be changing (and already has changed in the QCA decision noted above) and suggests a potential convergence between those approaches with that adopted in the cost of capital IM.

Debt premium – service-specific or supplier-specific

H5.27 The interest cost of borrowing may vary between suppliers of electricity distribution services, gas pipeline services and Transpower. However, the use of notional leverage requires that the debt premium should reflect the notional leverage level and therefore the debt premium would be a notional debt premium. The notional debt premium should be associated with the Commission’s assessment of a Standard and Poors’ long-term credit rating of BBB+ for the service provided.⁹⁸¹

Approach to estimating the debt premium

H5.28 There are a range of options by which firms can raise debt. In simple terms, these options include bank loans, issuing bonds in New Zealand to institutions or the public and issuing bonds overseas. Each option has its own market volume, tenor and credit worthiness characteristics.

H5.29 In principle, there are two generic ways of estimating the debt premium. The ‘simple approach’ only considers credit-rated publicly traded corporate bonds denominated in New Zealand dollars when calculating the debt premium. The ‘complex approach’ acknowledges that firms may raise debt capital through a number of channels in addition to issuing bonds in New Zealand.

Estimating the debt premium - the ‘simple approach’

H5.30 The simple approach to estimating the debt premium involves three steps:

- i. identify credit-rated publicly traded vanilla⁹⁸² corporate bonds denominated in New Zealand dollars, issued by the regulated service in question in New Zealand and, as a cross-check, issued by other infrastructure businesses which are not the regulated service in question, in New Zealand.
- ii. obtain the market yield to maturity on these bonds and the contemporaneous risk-free rate, and estimate the debt premium by taking the difference between these two.
- iii. estimate, by interpolation, what the debt premium would be for a term to maturity equal to the regulatory period, consistent with a specified S&P long-term credit rating, or equivalent rating from Moody’s or Fitch, for bonds issued by suppliers of the regulated service in question.

⁹⁸⁰ Australian Competition Tribunal, *Application by ActewAGL Distribution [2010] ACompT 4*, 17 September 2010, paragraph 72.

⁹⁸¹ The appropriate credit rating is discussed below, commencing at paragraph H5.46.

⁹⁸² Vanilla bonds are defined as senior unsecured nominal debt obligations denominated in NZ\$ without callable, puttable, conversion, profit participation, credit enhanced or collateral features.

- H5.31 Advantages of the simple approach to estimating debt premiums are that it is relatively simple and easy to understand and it is transparent and objective as it only uses publicly available data. Due to its generic nature, the simple approach to estimating debt premiums requires fewer subjective assumptions regarding, for example, treasury risk management policies or market issuance capacity.
- H5.32 The main disadvantage of the simple approach to estimating debt premiums is that it does not recognise any other means by which firms can raise debt except publicly traded corporate bonds. However, data for these other means is not publicly available.

Estimating the debt premium - the 'complex approach'

- H5.33 The complex approach to estimating the debt premium involves, first, estimating the debt premium for each option by which firms can raise debt denominated in (or swapped back to) New Zealand dollars. Second, it involves estimating the overall debt premium by making assumptions about the weighting of each borrowing option in a notional debt portfolio.
- H5.34 A number of submitters argued that the simple approach to estimating debt premiums would ignore the fact that firms raise debt capital through a number of channels in addition to corporate bonds, e.g. bank debt and issuing bonds overseas. Submitters claim that ignoring these channels could result in an estimated debt premium that was not representative of firms' actual debt premiums.⁹⁸³
- H5.35 Unison submitted a model that sets out the range of borrowing options available in practice to large New Zealand firms, and the respective estimated debt premium associated with each option. The model uses these individual estimated debt premiums to estimate an overall debt premium for a supplier of regulated services. To generate the overall debt premium, the model uses various market-related assumptions (e.g. market bond issuance capacity) and entity-related assumptions

⁹⁸³ Auckland Energy Consumer Trust, *Cross Submission to the Commerce Commission on Cost of Capital Workshop*, 2 December 2009, p. 21; PricewaterhouseCooper, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, Report on behalf of 17 EDBs, 2 December 2009, p. 13; Telecom Limited, *Post-workshop Submission on the Cost of Capital*, Attachment: PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, 2 December 2009, p. 12; Synergies Economic Consulting, *Cost of Capital Cross Submission*, Report on behalf of Vector, 2 December 2009, pp. 11-13; Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital*, Report on Behalf of NZAA, 2 December 2009, pp. 42-51; Unison, *Post-Conference Submission on the Weighted Average Cost of Capital*, 2 December 2009, Section 4; Vector, *Cross Submission to the Commerce Commission on the Weighted Average Cost of Capital Workshop*, 2 December 2009, pp. 19-20; Wellington Electricity, *Post-Workshop Submission for the Commerce Commission's Cost of Capital Workshop*, November 12 and 13, 2009, 3 December 2009, p. 6 and Commerce Commission, *Cost of Capital Workshop Transcript*, pp. 144-158; NZ Airports Association, *Submission on Draft Information Disclosure Determination and Draft Reasons Paper*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper - Report for NZAA*, 12 July 2010, pp. 27-28; NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p. 40; Auckland International Airport Limited, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p.12; Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, pp. 16-17; Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Asia-Pacific Risk Management Limited, *Commerce Commission Cost of Debt Funding Submission Report: prepared for Unison Networks Limited*, 12 August 2010, p. 34; Wellington Electricity Lines Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper, Draft Cost of Capital Input Methodology Decision*, 13 August 2010, pp. 9-10.

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- (e.g. the entity's treasury risk management policies with respect to liquidity management and minimum headroom) to determine the weighting of each borrowing option in the debt portfolio.⁹⁸⁴
- H5.36 The main advantage of the complex approach to estimating debt premiums is that it recognises that firms may raise debt through a number of different channels. As such, this approach better mimics firms' actual behaviour.
- H5.37 The main disadvantages of this approach are that it requires data that: (a) is firm-specific and does not correspond to a representative benchmark; and (b) is not publicly available. The use of non-publicly available data would reduce certainty to suppliers and users as it may impede their ability to independently replicate the estimation process.
- H5.38 In terms of the ability to obtain the necessary data for this approach, very few debt suppliers in New Zealand would be in a position to supply reliable non-public market representative data, and it is unclear if these entities could be considered unconflicted (as they might be shareholders, advisers to, or debt capital suppliers of the relevant supplier).
- H5.39 If the Commission were to attempt to benchmark using the debt premium on bank loans, it would face the practical issue of obtaining reliable independent data as to what the 'market' average debt premium on bank loans actually is. This is because, by its nature, this information is private and each debt premium 'quote' reflects an individual bank's (undisclosed) assessment of the creditworthiness of the specific borrower, together with the bank's (undisclosed) required financing terms and covenants. The debt premium currently shown in the Unison model presumably reflects Unison's banker's assessment of Unison's creditworthiness. However, the assessed creditworthiness is not stated nor are the financing terms or covenants required by the specific bank disclosed.
- H5.40 Any attempt by the Commission to obtain useful data would first need to define a benchmark creditworthiness and 'terms sheet', against which quotes of the applicable debt premium could be obtained, and secondly, would need to involve real potential customers to give the banks an incentive to provide realistic, market driven quotes. Debt premium quotes from all of the banks would be required if something approaching a 'market' average debt premium for bank loans was to be estimated.
- H5.41 Estimating an overall debt premium for the range of options by which debt can be raised would also require various assumptions to be made so that the weighting of each borrowing option in the notional debt portfolio could be determined. The nature of the assumptions required, (e.g. various market related assumptions, including maximum issuance capacity and minimum issue size; and various entity related assumptions; including the entity's treasury risk management policies with respect to liquidity management and minimum headroom), means that it is unlikely that the Commission could specify a group of assumptions that all suppliers, yet alone suppliers and users, would agree on.

⁹⁸⁴ Unison, *Unison Networks Limited Cost of Debt Model*, 22 December 2009.

Conclusion - approach to estimating the debt premium

H5.42 On balance, the Commission considers that it should continue to use the simple approach to estimating debt premiums.⁹⁸⁵ This is for three main reasons:

- First, whilst there are a range of options available to suppliers for raising debt, publicly available data with respect to the debt premiums are only available for publicly traded bonds, which form the basis of the simple approach.
- Second, other than for publicly traded bonds, debt premiums are generally not publicly available. Using the complex approach to estimate debt premiums would require such non-public data, which is likely to impede the ability of suppliers and interested parties to independently replicate the debt premium estimation process.
- Third, a Unison model type approach requires several subjective assumptions to be made (e.g. weighting of each borrowing option in the debt portfolio) that are open to challenge by suppliers and users of regulated services.

H5.43 The Commission notes two key differences between Unison's and the Commission's debt premium estimate. First, the dates for the debt premium information are not the same. Second, while Unison's estimate is specific to their company, the Commission's estimate is service-wide. Despite these differences, the overall debt premium estimated by the Unison model is similar to the debt premium estimate shown in the Commission's straw person example which used the simple approach to estimating debt premiums.

H5.44 The Commission, like the Australian regulators (for example, AER, IPART, QCA), has consistently adopted the simple approach to estimating debt premiums.

H5.45 The Commission notes that for any maturity period up to approximately four years, the all up debt premium (that is, including debt issuance costs) on a bank loan is likely to be lower than the all up debt premium (including debt issuance costs) on publicly traded corporate bonds.⁹⁸⁶ In practice, firms rarely borrow directly from a bank for a five-year term, and thus the actual all up debt premium incurred by firms on a bank loan (unless a firm were deemed particularly un-creditworthy) would most likely be less than the all up debt premium on a publicly traded corporate bond with five years to maturity. The Commission therefore considers its approach to be relatively favourable to suppliers.

Credit ratings and the debt premium

H5.46 As discussed above, the Commission will approximate the corporate rate of borrowing using publicly traded corporate bonds denominated in New Zealand

⁹⁸⁵ PwC (for ENA) accepted that there were valid arguments in favour of the simple approach, however PwC had concerns with the application. See Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, pp. 21-33.

⁹⁸⁶ Against this, bank loans usually require compliance with a range of more onerous financing terms (including regular reporting to the bank) and covenants. In addition, this is one of the main reasons that new publicly traded corporate bonds are rarely issued for an original period to maturity of less than four years.

- dollars. An important determinant of a bond's debt premium is the market's assessment of, amongst other things, its credit worthiness. The long-term credit rating associated with the bond can be used as a proxy of this creditworthiness.
- H5.47 In the RDG and IM Discussion Paper, the Commission proposed to benchmark allowed debt premiums against the premiums paid by firms on bonds of a reasonable long-term investment grade from a major credit rating agency, e.g. S&P / Moody's ratings A-/A3 or BBB+/Baa1.
- H5.48 At the Cost of Capital Workshop a number of suppliers encouraged the Commission to think about a lower benchmark credit rating than outlined in the RDG and IM Discussion Paper.⁹⁸⁷ For example, Mr. Morgan (for Unison) preferred a range of BBB to BBB+ as that was the credit rating that he observed most of the EDBs were within. Mr. Basher (for NZAA and WIAL) preferred a lower than A- credit rating, stating that as a consequence of potential investment programmes airports are about to undertake, the extra borrowing required may lead to a reduction in credit ratings and if the firms were not going to receive compensation for that borrowing through a regulatory rate there was a risk that they could be discouraged from making the investment.⁹⁸⁸
- H5.49 In submissions on the Draft Reasons Papers suppliers of regulated services considered the benchmark credit rating was too high. EDBs and GPBs submitted for a Standard and Poors' long-term credit rating of BBB rather than BBB+.⁹⁸⁹ A number of these parties submitted that the credit rating should be the same as the average credit rating of the comparative firms sample used to estimate the asset beta.
- H5.50 In previous regulatory decisions, the Commission has considered advice from Dr Lally on the appropriate debt premium.
- H5.51 Dr Lally in his advice on Electricity Distribution – Control of Unison, did not reference a credit rating in order to estimate the debt premium.⁹⁹⁰ Instead he relied on the estimate used in the Airports Inquiry, supplemented by data from Powerco and Vector.⁹⁹¹

⁹⁸⁷ Commerce Commission, *Cost of Capital Workshop Transcript*, pp. 143-158.

⁹⁸⁸ *ibid.*, p. 145 and p. 148.

⁹⁸⁹ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, pp. 9-12 and pp. 26-27; Powerco Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, p. 15; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, 13 August 2010, p. 21; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Bancorp Treasury Services Limited, *Expert Report to Vector Limited*, August 2010, pp. 25-33; Wellington Electricity Lines Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, pp. 9-10.

⁹⁹⁰ Lally, M., *The weighted average cost of capital for electricity lines businesses*, September 2005, pp. 55-57.

⁹⁹¹ Powerco and Vector currently have publicly traded bonds with a S&P long-term credit rating of BBB and BBB+ respectively.

- H5.52 Similarly, in the Gas Control Inquiry and the Gas Authorisation, Dr Lally estimated a debt premium using data from both Powerco and Vector. In the Gas Authorisation Dr Lally did not favour specifying a credit rating as he considered it was not apparent what credit rating to specify. Further, even if a credit rating could be specified, such as BBB, Dr Lally noted that there were not enough bonds on offer to enable estimation of a debt premium.⁹⁹²
- H5.53 Table 1 of the Commission's Straw Person Example displayed the credit ratings of New Zealand (and overseas) companies that supply electricity distribution and/or transmission services (among other services).⁹⁹³ The table showed that Vector's and Mighty River Power's S&P long-term credit rating is BBB+, and that of Powerco and Contact Energy is BBB. The table also showed that the S&P long-term credit rating of Transpower is AA-.
- H5.54 It is standard practice amongst overseas regulators (such as the AER, Ofgem, Ofwat, Ofcom, the UK Competition Commission, and the UK CAA) to specify an appropriate long-term credit rating on debt for the service in question and then to estimate the debt premium or cost of debt using debt with the same or similar long-term credit rating.⁹⁹⁴
- H5.55 The AER in estimating the cost of debt to Australian energy businesses has applied a S&P long-term credit rating of BBB+.⁹⁹⁵ In its draft decision for Jemena the AER concluded that there was not sufficient evidence to depart from the past regulatory practice of using a S&P long-term credit rating of BBB+ and considered that its conclusion in its 2009 WACC review remained valid.⁹⁹⁶
- H5.56 Ofgem's approach, for electricity, is to base the cost of debt on the yield from a mixture of bonds of utility companies with a S&P long-term credit rating of BBB and A. In its 2009 electricity price control review Ofgem included a small margin to allow for a range of factors e.g. transaction costs.⁹⁹⁷ Ofgem's approach for gas has been:⁹⁹⁸

In line with previous price controls, our financial model makes no assumptions about the structure of the debt. However, we have assessed financeability based on whether a

⁹⁹² Lally, M., *The weighted average cost of capital for gas pipeline businesses*, 28 October 2008, pp. 85-86. The only bond available at the time of the Gas Authorisation was unusable.

⁹⁹³ Commerce Commission, Cost of Capital Workshop, Straw Person Example, November 2009, Table 1, p. 6.

⁹⁹⁴ AER, *Final decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009; Ofgem, *Electricity Distribution Price Control Review Final Proposal*, 7 December 2009, pp. 49-51; PricewaterhouseCoopers, *Advice on the cost of capital analysis for DPCR5*, Final Report to the Office of Gas and Electricity Markets, 28 July 2009, pp. 59-71; Ofwat, *Future Water and Sewerage Charges 2010-2015 – Final Determination*, April 2009, p. 8; Ofcom, *Ofcom's approach to risk in the assessment of the cost of capital*, August 2005; Competition Commission, *Stansted Airport Ltd - Q5 price control review*, 23 October 2008, Appendix L, p. L5; Competition Commission, *BAA Ltd - A report on the economic regulation of the London airport companies (Heathrow Airport Ltd and Gatwick Airport Ltd)*, 28 September 2007, Appendix F; CAA, *Airport Regulation - Economic Regulation of Stansted Airport 2009-2014 - CAA Decision*, 13 March 2009.

⁹⁹⁵ AER, *Final decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009.

⁹⁹⁶ AER, *Draft Decision - Jemena - Access arrangement proposal for the NSW gas networks - 1 July 2010 - 30 June 2015*, February 2010, p. 136.

⁹⁹⁷ Ofgem, *Electricity Price Control Review Final Proposal*, 7 December 2009, pp. 49-51.

⁹⁹⁸ Ofgem, *Gas Distribution Price Control Review Final Proposals*, 3 December 2007, pp. 108, paragraph 9.37.

GDN funded with nominal debt is likely to be able to achieve financial ratios that are, as a package, consistent with a comfortably investment grade credit rating.

Conclusion - credit rating

H5.57 The Commission considers that a S&P long-term credit rating of BBB+ (or equivalent rating from Moody's or Fitch) is appropriate for benchmarking the allowed regulated service wide debt premium on the debt of EDBs, GPBs and Transpower. The Commission considers that the notional long-term credit rating used for estimating the regulated service wide notional debt premium should reflect a prudent long-term level of exposure to credit default risk. Specifically, the notional long-term credit rating should be, and remain, comfortably within an 'investment grade' credit rating as defined by the major credit rating agencies, and a S&P long-term credit rating of BBB+ (or equivalent rating from Moody's or Fitch) is the minimum notional long-term credit rating that provides an adequate margin of safety with respect to EDBs, GPBs and Transpower. Setting the minimum notional long-term credit rating at, for example, BBB (being only one notch above BBB-, the lowest investment grade long-term credit rating) provides a materially lower margin of safety that a reasonable investment grade is maintained in the long-term.

H5.58 A S&P long-term credit rating of BBB+ is consistent with the approach adopted by the AER in Australia and is within the range considered by Ofgem in the UK.

H5.59 Published long-term credit ratings, and the associated market yields, on corporate bonds are influenced by a range of factors. These factors include the nature of the entity (not just the regulated service, unless it is an entity which operates a stand-alone or 'pure play' business that corresponds to a single regulated service); the owner of the entity and the assessed likelihood of the owner standing behind the entity and its debt, if it were to get into difficulty. From a regulatory perspective, the Commission is interested in the long-term credit rating of the supplier of the regulated service on a stand-alone basis. However, in practice, the Commission is unable to ring fence the regulated service (and its associated credit rating) from the remainder of the entity.

Limited number of publicly traded bonds in New Zealand

H5.60 The EDB and GPB Draft Determination specified that the debt premium was to be estimated based only on the observed yields of publicly traded bonds with a S&P long-term credit rating of BBB+.

H5.61 There are only a limited number of publicly traded vanilla New Zealand dollar denominated corporate bonds that are issued by an EDB or GPB that is neither majority owned by the government nor a local authority, with a S&P long-term credit rating of BBB+, or equivalent rating from Moody's or Fitch. Some submitters on the Draft Reasons Paper considered that reliance only on BBB+ bonds may not be workable or feasible in practice.

H5.62 As discussed in the Update Paper, the Commission has amended the Final Determination to progressively expand the range of publicly traded bonds considered to include:

- those which are not issued by an EDB or GPB;

- those with a S&P long-term credit rating other than BBB+; and
- those issued by an entity majority owned by the government or a local authority.⁹⁹⁹

However, in each case adjusting the observed debt premium to approximate the debt premium that is likely to have been observed had the bond been of the type described in H5.61. In short, the Final Determination enables the Commission to have regard to a wider range of information on prevailing debt premiums, but sets out a methodology to ensure the premium estimated is that which could reasonably be expected to relate to a bond with a Standard and Poors' long-term BBB+ credit rating.

H5.63 A range of submissions were received on the revised debt premium methodology in the Technical Consultation round. ENA sought further clarification around certain points of detail,¹⁰⁰⁰ and Powerco submitted that the IM “should provide more detail” as under the draft IM (as released for technical consultation in October 2010) Powerco “cannot estimate the material effects of the methodology”.¹⁰⁰¹ Vector describes the proposed methodology as “unsatisfactory in that it is almost completely subjective”,¹⁰⁰² while CEG (for Vector) submitted that the accuracy of the cost of debt estimate would be improved and its volatility lowered if all that the Commission methodology said was “the Commission will have regard to all relevant information, including submissions from interested parties, when arriving at an estimate of the notional cost of debt for a benchmark bond with the characteristics that they are issued by an EDB, have a qualifying rating of BBB+ debt, and have a remaining term to maturity of 5 years”.¹⁰⁰³

H5.64 Other submissions supported the revised approach. For example, NZ Airports Association submitted that:¹⁰⁰⁴

The Commission’s proposal to have regard to bonds with a wider range of long-term credit rating and issuers other than just Airports will likely result in a more commercially realistic debt premium.

⁹⁹⁹ See, for example, Commerce Commission, *Input Methodologies (Electricity Distribution Services) Consultation Update Paper*, 22 October 2010; Commerce Commission, *Input Methodologies (Gas Pipeline Services) Consultation Update Paper*, 1 November 2010.

¹⁰⁰⁰ For example, where the Commission will source its bond yield information, how the averaging would be done, and how the Commission will weight the different estimates of the debt premium. Electricity Networks Association, *Submission on Technical Consultation on Parts 1-4 of Revised Input Methodologies*, 12 November 2010, pp. 10-11.

¹⁰⁰¹ Powerco Limited, *Powerco submissions on Parts 1-4 of revised draft input methodologies determination for electricity and gas distribution businesses*, 12 November 2010, p. 3.

¹⁰⁰² Vector, *Submission I response to the Commerce Commission’s Revised Draft Determinations and Consultation Update Papers for Electricity Distribution Businesses and Gas Pipeline Businesses, Cost of Capital*, 16 November 2010, p. 4.

¹⁰⁰³ Vector Limited, *Submission I response to the Commerce Commission’s Revised Draft Determinations and Consultation Update Papers for Electricity Distribution Businesses and Gas Pipeline Businesses, Cost of Capital*, Attachment: Competition Economists Group, *Review of updated input methodologies*, November 2010, p. 21.

¹⁰⁰⁴ NZ Airports Association, *Technical consultation: Submission on revised draft input methodology determinations*, 22 October 2010, p. 14.

H5.65 Telecom submitted that:¹⁰⁰⁵

The Commission has amended its proposed approach to assessing a debt margin based on comparator company market evidence. We agree with this broadened approach on this issue.

H5.66 In light of submissions on technical consultation, the final determination includes floating rate bonds, and specifies that the debt premium observed on bonds with a remaining term of less than five years will ordinarily be taken as the minimum debt premium for a five year term.

H5.67 The Commission does not accept that the methodology is subjective. The Commission considers that its methodology for estimating the debt premium strikes an appropriate balance between:

- promoting certainty for consumers and suppliers in relation to the estimation of the debt premium; and
- providing the flexibility necessary to ensure the methodology is workable for the duration of the IM, given the number of publicly traded bonds in New Zealand and that the composition of those bonds will change over time.

H5.68 A worked example on the estimation of the debt premium for EDBs is included from paragraph H5.109.

Averaging period

H5.69 Debt premiums on corporate bonds, and the risk-free rate, are continually changing. Therefore the timing of when these rates are determined for the purposes of estimating the cost of capital could have a material effect on the estimate.

H5.70 In previous regulatory decisions, the Commission has used the month end corporate borrowing rate for the two or three preceding month ends.

H5.71 The availability of relevant data is gradually improving over time. As a consequence, to minimise the effect of unusual market volatility, the IM provides for the use of the average of the daily observations for one calendar month prior to when the cost of capital is being estimated for both the debt premium and the risk-free rate.

Updating the debt premium

H5.72 As outlined above, the debt premium (similar to the risk-free rate) can be subject to volatility. This volatility has been particularly pronounced during the recent GFC. Therefore, the Commission will update its estimate of this parameter each time it is required to estimate the cost of capital. However, once a price-quality path has been set the supplier of regulated services will be subject to that debt premium for the term of the DPP or CPP.

¹⁰⁰⁵ Telecom, *Input methodologies electricity distribution services – WACC (cost of capital)*, 12 November 2010, p. 2.

Standard error of the debt premium

H5.73 The debt premium is an estimate and as such has uncertainty associated with it. The standard error captures this uncertainty and will be estimated alongside the debt premium parameter on an annual basis.

H5.74 The standard error of the debt premium, denoted by s_n , is estimated using the following formula:

$$s_n = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}$$

where:

N is the number of sample observations;

x_i are the observed values of the sample items; and

\bar{x} is the mean value of these observations (the debt premium estimate).

H5.75 In estimating the standard error of the debt premium the Commission will have regard to bonds rated BBB+¹⁰⁰⁶ that are issued by an EDB/GPB that are neither majority owned by the Crown nor a local authority.

H5.76 However, if there are no bonds that meet the criteria above the Commission considers that an appropriate floor for the debt premium standard error is 0.0015.

Commission's reasons - debt issuance costs

H5.77 Debt issuance costs are the costs associated with issuing debt capital that firms incur in addition to the interest rate paid on the debt itself. Debt capital normally has a finite period to maturity, so debt capital needs to be re-financed regularly. The Commission considers that debt issuance costs to re-finance debt capital are a legitimate expense that ought to be compensated.¹⁰⁰⁷ As the IM adopts a notional debt premium a notional allowance is also made for debt issuance costs.

H5.78 There are two possible approaches to compensating for debt issuance costs—through cash flows or a margin that is added to the cost of debt capital.

H5.79 In advice on the Gas Authorisation Dr Lally considered that the allowance for debt issuance costs in the cost of debt capital as opposed to including them in the cash flows was superior, because it allocates the costs to all periods rather than concentrating them in the periods in which they are paid.

H5.80 In advice to the Commission in the Expert Panel report, Dr Lally recommended that the Commission include debt issuance costs in the cost of capital. Professor Myers recommended that the Commission handle debt issuance costs through the regulatory cash flows and not in the cost of capital.¹⁰⁰⁸

¹⁰⁰⁶ By Standard and Poors or an equivalent rating by Moody's or Fitch's.

¹⁰⁰⁷ In contrast, equity capital is normally available into perpetuity and does not need regular refinancing. Therefore, the Commission has not included an equity issuance cost allowance in estimating the cost of equity capital as the implied issuance cost per annum is immaterial.

¹⁰⁰⁸ Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, Report prepared for the Commerce Commission, 18 December 2008, p. 32.

H5.81 In advice on the Gas Authorisation and 2006/2007 and 2007/2008 TSO net cost calculation determinations, Dr Lally recommended that the Commission include debt issuance costs in the cost of debt capital as a 30 basis points addition.¹⁰⁰⁹ This figure was derived from Lee, Lochhead, Ritter and Zhao (Table 2) who found that the average cost of a new bond issue was approximately 130 basis points (1.30%).¹⁰¹⁰ The 30 basis points (0.3%) is the result of annualising the 130 basis points (1.30%) cost for a new bond issuance over five-years, and rounded up from an estimate of 26 basis points (0.26%).

H5.82 Some submitters provided more recent data on the costs of issuing publicly traded bonds in New Zealand:

- based upon its identified sample of 17 bond prospectuses for New Zealand dollar denominated debt, PwC (for ENA and Telecom) provided evidence that implied an average debt issuance cost of 37 basis points (0.37%) per annum;¹⁰¹¹
- Asia Pacific Risk Management (for Unison) did not provide a separate analysis but stated that they agreed with PwC's conclusions;¹⁰¹² and
- based upon its identified sample of 23 bond prospectuses for New Zealand dollar denominated debt, Bancorp (for Vector) provided evidence that implied an average debt issuance cost of 47 basis points (0.47%) per annum.¹⁰¹³

H5.83 PwC and Bancorp's analysis has been based on the amount of debt offered. However, according to the Bancorp analysis, approximately half of the offers they identified actually raised significantly more debt than that offered, i.e. significant over-subscription were accepted. This over-subscription would almost certainly lower the actual basis point per annum equivalent of the average debt issuance costs incurred below PwC's and Bancorp's respective estimates.¹⁰¹⁴

¹⁰⁰⁹ Lally, M., *The weighted average cost of capital for gas pipelines businesses, paper prepared for the Commerce Commission*, 28 October 2008, p. 87; Lally, M., *The Estimated Debt premium for the TSO*, report prepared for the Commerce Commission, 25 June 2009.

¹⁰¹⁰ Lee, I., Lochhead, S., Ritter, J. and Zhao, Q., *The Cost of Raising Capital*, *The Journal of Financial Research*, Vol. 19, 1996, pp. 59-74.

¹⁰¹¹ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, p. 34; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, p. 34.

¹⁰¹² Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Asia-Pacific Risk Management Limited, *Commerce Commission Cost of Debt Funding Submission Report: prepared for Unison Networks Limited*, 12 August 2010, p. 37.

¹⁰¹³ Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Bancorp Treasury Services Limited, *Expert Report to Vector Limited*, August 2010, p. 59.

¹⁰¹⁴ Not surprisingly, there is substantial overlap between the samples identified by PwC and Bancorp. However, there are a number of discrepancies in the detail of those offers which appear in both samples.

- H5.84 Adjusting the issuance costs for the debt actually raised (as identified by Bancorp), PwC's evidence implies an average actual debt issuance cost of 33 basis points (0.33%) per annum, and Bancorp's evidence implies an average actual debt issuance cost of 34 basis points (0.34%) per annum.¹⁰¹⁵
- H5.85 Notwithstanding some issues with the quality of the data regarding the costs of issuing publicly traded bonds in New Zealand, the Commission considers this publicly available data does provide an improved basis for estimating the level of debt issuance costs. Therefore, the Commission has increased the allowance for debt issuance costs to 35 basis points (0.35%) per annum, based on amortising the debt issuance costs over the same period as the term of the debt premium i.e. five years. The Commission considers this to be a generous allowance. The allowance is higher than the allowance used by other regulators but the Commission considers this is reasonable as New Zealand entities tend to be smaller debt issues than their overseas counterparts.
- H5.86 The Commission notes that the Australian regulator, IPART, allows 12.5 basis points (0.125%) per annum for debt issuance costs. The UK Competition Commission allowed 15 basis points (0.15%) per annum in the Heathrow and Gatwick decision, but in the subsequent Stansted decision noted that this was too high and reduced the allowance for debt issuance costs to 10 basis points (0.10%) per annum.
- H5.87 The submission from PwC (for ENA and Telecom) also highlighted that some small firms have incurred much higher debt issuance costs when issuing bonds in New Zealand – their analysis implied average debt issuance costs of 160 basis points (1.60%) per annum.¹⁰¹⁶ The Commission does not consider that this evidence is relevant to EDBs, GPBs and Transpower. None of these small firms identified by PwC are subject to price-quality regulation under Part 4 or have a similar risk profile to EDBs, GPBs and Transpower. These firms are not comparable with EDBs, GPBs and Transpower. In addition, three of the five referenced bond issues date from 2001. It is likely that these small firms issued bonds, rather than obtain bank loans, to avoid compliance with a range of potentially more onerous financing terms (including regular reporting to the bank) and covenants imposed by banks. Setting the allowance for debt issuance costs based upon this evidence would imply, amongst other things, that consumers of the type of regulated services covered under Part 4 of the Act should be required to pay the costs of decisions by small firms to remain inefficiently small.
- H5.88 Asia Pacific Risk Management (for Unison) and Bancorp (for Vector), submitted that allowance should also be made for the costs of maintaining committed bank

¹⁰¹⁵ Although the actual debt issuance costs are likely to have been slightly higher due to the higher amount of debt actually raised. Therefore, the average actual debt issuance cost per annum would be slightly higher than these estimates.

¹⁰¹⁶ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, p. 36; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, p. 35.

liquidity lines.¹⁰¹⁷ The Commission notes that these types of facilities typically support short term funding programmes, such as commercial paper programmes. Neither submitter presented any evidence that the all up debt premium of these facilities exceeded the all up debt premium allowed by the Commission's approach based on publicly traded bonds. In fact, Asia Pacific Risk Management (for Unison) presented a table setting out the all up debt premium over New Zealand government bonds for committed bank funding facilities ranging from one year up to five years (the all up debt premium increases with term). It noted that the all up debt premium for a five year committed bank funding facility is similar to the all up debt premium of a five year publicly traded bond.¹⁰¹⁸ This implies that the Commission's approach of estimating the all-up premium on public bonds produces a reasonable estimate of the cost of bank loans.

H5.89 Asia Pacific Risk Management (for Unison), Bancorp (for Vector) and Vector submitted that allowance should also be made for the costs associated with raising debt offshore, including the conversion factor and basis swap spread.¹⁰¹⁹

H5.90 Asia Pacific Risk Management (for Unison) also submitted that EDBs would view the New Zealand debt capital market as their primary funding source and would only tap international debt capital markets on an opportunistic basis.¹⁰²⁰ Asia Pacific submitted that:

EDB's would "tap" these funding markets when considered favourable relative to the NZ debt market. Any decision to issue in an international market would be considered relative to what could be achieved in the NZ market. It is unlikely that an EDB would have an ongoing bond programme in an international market; rather issues are less frequent and privately placed with wholesale investors. An ongoing funding programme, such as Powerco's, is more likely in the NZ debt markets. Accordingly, I do not believe an arithmetical weighting of NZ and Australian international debt premium amounts, of similar issuers and terms, is appropriate.¹⁰²¹

¹⁰¹⁷ Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Asia-Pacific Risk Management Limited, *Commerce Commission Cost of Debt Funding Submission Report: prepared for Unison Networks Limited*, 12 August 2010, pp. 36-38; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Bancorp Treasury Services Limited, *Expert Report to Vector Limited*, August 2010, pp.40-43.

¹⁰¹⁸ Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Asia-Pacific Risk Management Limited, *Commerce Commission Cost of Debt Funding Submission Report: prepared for Unison Networks Limited*, 12 August 2010, p. 34.

¹⁰¹⁹ Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Asia-Pacific Risk Management Limited, *Commerce Commission Cost of Debt Funding Submission Report: prepared for Unison Networks Limited*, 12 August 2010, pp. 31-34; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Bancorp Treasury Services Limited, *Expert Report to Vector Limited*, August 2010, pp. 42-43.

¹⁰²⁰ Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Asia-Pacific Risk Management Limited, *Commerce Commission Cost of Debt Funding Submission Report: prepared for Unison Networks Limited*, 12 August 2010, p. 31.

¹⁰²¹ Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Asia-Pacific Risk

H5.91 In contrast, Bancorp (for Vector) submitted that:¹⁰²²

We are also of the opinion that the Commission should consider using pricing levels from Australia when determining the debt premium. We do not recommend using pricing data from other jurisdictions such as the United Kingdom or the United States other than as a 'reasonableness' test given the inherent difficulties in trying to calibrate these to reflect New Zealand specific conditions.

H5.92 An EDB or GPB may decide to obtain a portion of its funding from offshore, where the cost of such funding is considered more attractive than financing in New Zealand. However, as the primary funding source is New Zealand, New Zealand sourced estimates are the benchmark.

Conclusion - debt issuance costs

H5.93 The Commission considers that costs associated with prudent refinancing are legitimate expenses that ought to be compensated. In principle, so long as suppliers of regulated services are compensated only once for debt issuance costs, the Commission is indifferent as to whether the compensation occurs through the allowed cash flows or as a margin on the cost of debt capital.

H5.94 The cost of capital IM provides a supplier with compensation for a notional cost of debt capital rather than its actual cost of debt capital. As such, it should also incorporate the debt issuance costs as a notional amount in the cost of debt capital rather than as an actual cost in the cash flows. On this basis, the appropriate way to allow for debt issuance costs is by adding a margin on the cost of debt capital, rather than the alternative of requiring estimation of nominal debt capital so as to derive a dollar cash flow value of debt issuance costs.

H5.95 Whilst there are a range of options available to suppliers for raising debt, publicly available data with respect to debt issuance costs is only available for publicly traded bonds. Using other options would require the use of non-public data, which is likely to impede the ability of suppliers and interested parties to independently replicate the debt issuance cost estimation process. The Commission considers that an allowance for debt issuance costs of 35 basis points p.a. (0.35% p.a.) added to the cost of debt capital is appropriate, based on amortising the debt issuance costs over the same period as the term of the debt premium i.e. five years.

H5.96 The Commission notes that, while there is some level of uncertainty as to what the true debt issuance costs are, this uncertainty has little effect on suppliers' cost of capital as a small difference in debt issuance costs is likely to be immaterial to the final allowed rate of return. Therefore, no allowance is made for the standard error of debt issuance costs.

Management Limited, *Commerce Commission Cost of Debt Funding Submission Report: prepared for Unison Networks Limited*, 12 August 2010, p. 2.

¹⁰²² Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Bancorp Treasury Services Limited, *Expert Report to Vector Limited*, August 2010, p. 34.

Will the IM produce commercially realistic estimates of the debt premium and debt issuance costs?

- H5.97 This section discusses whether the IM will produce commercially realistic estimates of the debt premium and debt issuance costs for regulated suppliers, given the actual debt premium and issuance costs for such suppliers.
- H5.98 The Commission has compared its estimate of the debt premium when applying the IM with the estimates provided through the Bloomberg New Zealand fair value curve. The Bloomberg fair value curve with the closest rating to the BBB+ rating is the New Zealand A fair value curve. As at 1 September 2010, the Commission estimates the debt premium on a BBB+ rated bond with a five-year remaining term to maturity as 2.0% p.a., while the corresponding Bloomberg fair value curve estimate of the debt premium for an A rated bond is 1.59% p.a. Given the differences in assumed credit ratings, the estimate of a 2.0% p.a. debt premium for a BBB+ rated bond is appropriate in the Commission's view.
- H5.99 The Commission requested confidential details of the costs actually incurred by regulated suppliers with respect to raising debt capital. The information provided by suppliers indicates that the all up debt premium (debt premium plus annual allowance for debt issuance costs) under the IM is comparable with the all up debt premium actually incurred on debt capital recently raised by suppliers. Relative to debt capital raised by suppliers in the past, the estimates provided under the IM are generous.
- H5.100 The Commission's request for information from regulated suppliers also obtained information on the issuance costs actually incurred on bonds that are currently on public issue. The Commission estimated the value weighted average debt issuance costs on publicly issued bonds for each supplier which responded. The average debt issuance costs averaged 0.22% p.a. This implies the 0.35% per annum allowance for debt issuance costs in the IM is appropriate, if not generous in favour of suppliers.
- H5.101 Bancorp (for Vector) submitted an analysis of debt issuance costs and proposed a considerably higher allowance for debt issuance costs.¹⁰²³ However, Bancorp's analysis makes little reference to the costs actually incurred by Vector with respect to raising its own debt capital. In light of the confidential information received from EDBs and GPBs in response to the Commission's request for information (referred to in the previous two paragraphs), the Commission is comfortable that the IM will produce an all up debt premium (including debt issuance costs) that is commercially realistic.
- H5.102 The IM estimates the debt premium by reference to the yields on New Zealand publicly traded bonds. The Commission notes that some firms can and do access other debt markets, especially via US private placements, to secure long maturity debt and diversify funding sources when it is attractive to do so. The Commission has considered whether the IM generates estimates of the all up debt premium that will allow regulated suppliers to access the US private placement market first by reference to the historic debt premiums between the New Zealand and US markets

¹⁰²³ Bancorp (for Vector), *Debt Issuance Cost Analysis*, 16 November 2010.

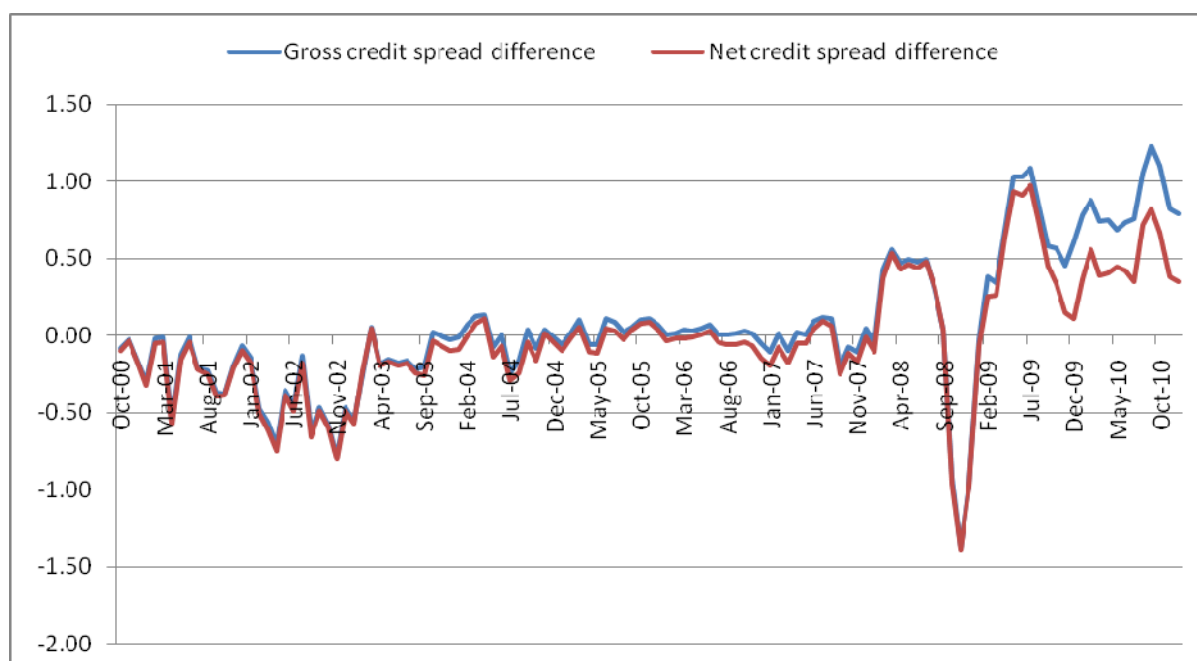
adjusting for costs; and second by reference to recent transactions involving AIAL, a supplier regulated under Part 4. Each is discussed in turn.

H5.103 Figure H5 below sets out the difference (gross credit spread difference) between:

- the credit spread between the Bloomberg NZ A fair value curve and the Bloomberg NZ swap rate, for a tenor of five years, over the last ten years; and
- the credit spread between the Bloomberg US Utility A fair value curve and the Bloomberg US swap rate, for a tenor of five years, over the last ten years.¹⁰²⁴

H5.104 The figure also shows this gross credit spread difference net of the Bloomberg NZD/USD basis swap spread, for a tenor of five years, (net credit spread difference) over the last ten years.

Figure H5 Raising US Debt – Gross and Net Credit Spread Difference



H5.105 Where this net credit spread difference is positive, this indicates the possibility that the all up cost of US dollar debt capital swapped to New Zealand dollars is less than the all up cost of New Zealand dollar debt capital. To ascertain whether this is definitely the case requires a consideration of costs not reflected in the net credit spread difference (for example, the conversion factor, Approved Issuer Levy, hedging credit cost, issue costs), and the 0.35% allowance for debt issuance costs specified under the IM.

H5.106 The Commission concludes that, on average over time, New Zealand referenced estimates of the debt premium are a reasonable proxy for US debt premiums (including the basis swap spread). Sometimes, the US market is relatively

¹⁰²⁴ Bloomberg fair value curves are used for this analysis as they provide an efficient and consistent basis for a comparison over an extended period of time. The A fair value curve is used as this is the closest available fair value curve to the A- (Airports) / BBB+ (EDB / GPB / Transpower) rating specified under the IM.

unattractive versus the New Zealand debt market (for example, 2000-2002) while at others times (such as the past 18 months) US debt markets are relatively cheaper and therefore attractive to New Zealand corporate borrowers. The Commission notes that a number of New Zealand firms have recently accessed the US debt markets for long maturity debt, including both AIAL and Vector (and have swapped it back to New Zealand dollars).

H5.107 In mid November 2010 Auckland International Airport publicly announced details of its sale of US\$150 million of notes (comprised of three tranches) in the US private placement market to re-finance maturing debt.¹⁰²⁵ Swapped into New Zealand dollars (i.e. including the cost of the basis swap, conversion factor and hedging credit cost), the notes provide long term funding at debt premiums over the New Zealand benchmark interest rate of 2.145% (10 year tenor), 2.078% p.a. (12 year tenor) and 2.268% p.a. (10 year tenor) respectively. This re-financing demonstrates that suppliers do use swaps and will raise debt capital overseas when it is cheaper to do so i.e. the all up cost of US dollar debt capital converted to New Zealand dollars is less than the all up cost of New Zealand dollar debt capital. Adjusting for the tenor of this long term debt capital, the debt premium payable by Auckland International Airport on its recent US issue is similar to the debt premium that would be estimated under the Commission's methodology (for example, based on the yield to maturity of Auckland International Airport's publicly traded bonds in New Zealand, the interpolated debt premium for a five year tenor is approximately 1.75% p.a. plus 0.35% per annum for debt issuance costs plus the term credit spread differential allowance).

H5.108 Based on the forgoing discussion of actual costs of debt incurred by New Zealand regulated suppliers, the Commission considers that the cost of capital IM will produce estimates of the cost of debt, including debt issuance costs, which are commercially realistic.

A worked example illustrating how the debt premium is estimated for EDBs

H5.109 Under the IM the debt premium will be estimated by taking account of the average debt premium, relative to five-year government stock, that would reasonably be expected to apply to publicly traded vanilla New Zealand dollar denominated corporate bonds issued by the regulated service in question that is neither majority owned by the government nor a local authority, with a Standard and Poors (S&P) long-term credit rating of BBB+ for EDB/GPB and Transpower (A- for Airports), or equivalent rating from Moody's or Fitch, and a remaining term to maturity of five-years.

H5.110 Under the IM the debt premium for a regulated service is to be estimated using the following three general steps:

- i. Identify credit-rated publicly traded vanilla¹⁰²⁶ corporate bonds denominated in New Zealand dollars, issued by the regulated service in question in New Zealand and, as a cross-check, issued by other

¹⁰²⁵ Auckland Airport, *Inaugural USPP Issuance for Auckland Airport*, NZX Market Release, 19 November 2010.

¹⁰²⁶ Vanilla bonds are defined as senior unsecured nominal debt obligations denominated in NZ\$ without callable, puttable, conversion, profit participation, credit enhanced or collateral features.

infrastructure businesses which are not the regulated services in question, in New Zealand.

- ii. Obtain the wholesale market yield to maturity on these bonds and the contemporaneous risk-free rate, and estimate the debt premium by taking the difference between these two.
- iii. Estimate, by interpolation, what the debt premium would be for a term to maturity equal to the regulatory period, consistent with a specified S&P long-term credit rating, or equivalent rating from Moody's or Fitch, for bonds issued by the regulated service in question.

H5.111 The IM determinations provide a more detailed description of the approach. For EDBs see IM EDBs determinations paper, Part 2, subpart 4, Clause 2.4.4.¹⁰²⁷

H5.112 To address the small number of bonds with the specified S&P (or equivalent) long-term credit rating that are publicly traded in New Zealand the IM Determination sets out a hierarchy of publicly traded bonds to be considered. These include:

- i. those which are not issued by the regulated service in question;
- ii. those with a S&P long-term credit rating other than the stipulated credit rating; and
- iii. those issued by an entity majority owned by the government or a local authority.

H5.113 In each case the observed debt premium is adjusted to approximate the debt premium that is likely to have been observed had the bond been of the type first described.

H5.114 This section provides a worked example of the process in the IM for estimating the debt premium for EDBs, GPBs and Transpower as at 1 September 2010.

Estimating the debt premium for EDB, GPB and Transpower.

H5.115 For EDBs, GPBs and Transpower the IM specifies that the appropriate S&P long-term credit rating for setting the debt premium is BBB+. This example estimates the debt premium for 1 September 2010.

H5.116 In the EDBs IM determinations Part 2, subpart 2, clause 2.4.4, subclause 3(d) indicates that the debt premium the Commission requires is the average spread that would be expected to apply to a vanilla NZ\$ denominated bond that:¹⁰²⁸

- i. is issued by an EDB or GPB that is neither majority owned by the crown nor a local authority;
- ii. is publicly traded;
- iii. has a qualifying rating of BBB+; and
- iv. has a remaining term to maturity of five-years.

¹⁰²⁷ Commerce Commission, *Commerce Act Electricity Distribution Services Input Methodologies Determination*, 22 December 2010. The same definition is also presented in Part 4, subpart 1, clause 4.1.4 and Part 5, subpart 3, section 4, clause 5.3.25 of this paper.

¹⁰²⁸ There is a difference between the estimation periods of the cost of capital between the various regulatory instruments. For the process for information disclosure see Part 2, subpart 4, clause 2.4.4 and for CPP see Part 4, subpart 3, section 4 clause 5.3.25 in the EDBs IM Determinations.

H5.117 Based on data from Bloomberg, Table H4 provides the remaining term to maturity and estimated debt premiums consistent with the remaining term to maturity of five-years following the EDBs determinations as at 1 September 2010. That is, it averages data for the month of August 2010, to estimate the debt premium for 1 September 2010, and interpolates to five-years remaining term to maturity (or closest period) the debt premium as the difference between the contemporaneous wholesale yields of the identified corporate bonds and government bonds.

Table H4 Bond Issuers and Debt Premiums Under Consideration

Bond Issuer	S&P long-term Credit Rating	Remaining Term to Maturity (years)	Estimated Debt Premium (% p.a.)
Transpower*	AA-	5	1.16%
AIAL*	A-	5	1.75%
Genesis Energy*	BBB+	5	1.58%
Mighty River Power*	BBB+	5	1.73%
Vector	BBB+	4.1	1.82%
WIAL	BBB+	3.2	2.34%
Contact Energy*	BBB	5	2.10%
Powerco*	BBB	5	2.24%

* interpolated from bonds with remaining term to maturity greater than and less than five years.

H5.118 Each IM Determination sets out the order in which the Commission will have regard to the debt premium estimates (for EDBs, see Part 2, subpart 4, clause 2.4.4, and especially subclauses 4 and 5 - all references after this point refer to the subclauses associated with clause 2.4.4).

H5.119 Subclause 4(a) indicates that the Commission will have regard to bonds that:

- i. have a qualifying rating of BBB+; and
- ii. are issued by an EDB or GPB that is neither majority owned by the Crown nor a local authority.

H5.120 In Table H4 there is only one bond that fits the criteria of subclause 4(a), which is the bond issued by Vector. However, this single bond has a remaining term to maturity of less than five-years.

H5.121 Subclause 5(b) states that the spread on a bond that has a remaining term to maturity of less than five-years will ordinarily be considered to be the minimum spread that would reasonably be expected to apply on an equivalently credit-rated bond issued by the same entity with a remaining term to maturity of five-years.

H5.122 Therefore, only taking into consideration subclause 4(a) the minimum debt premium for a qualifying rating of BBB+ is estimated to be 1.82% p.a.

H5.123 Subclause 4(b) indicates that the next criteria the Commission will have regard to are those issues that:

- i. have a qualifying rating of BBB+; and
- ii. are issued by an entity other than an EBD or GPB that is neither majority owned by the Crown nor a local authority.

H5.124 A bond issued by WIAL fits these criteria but has a remaining term to maturity of less than five-years (remaining term to maturity is 3.2 years). However, this bond is not considered to meet the criteria of subclause 5(b) as it appears to be anomalous (not normal) as this debt premium estimate is higher than the debt premium estimate of the lower rated longer-term BBB bonds of Contact Energy and Powerco.

H5.125 As a result, there are no results considered from subclause 4(b).

H5.126 The next criteria included in the IM is subclause 4(c) which indicates that the Commission will consider bond issues that:

- i. have a qualifying rating different to BBB+; and
- ii. are issued by an EBD or GPB that is neither majority owned by the Crown nor a local authority.

H5.127 There is one debt premium estimate that meets these criteria, the result from Powerco bonds with a BBB S&P long-term credit rating (that is, a rating lower than a BBB+). This five-year debt premium estimate is 2.24% p.a. Having regard to this estimate implies a debt premium for a qualifying rating of BBB+ would be less than 2.24% p.a.

H5.128 The next criteria included in the IM is subclause 4(d) which indicates that the Commission will consider bond issues that:

- i. have a qualifying rating different to BBB+; and
- ii. are issued by an entity other than an EBD or GPB that is neither majority owned by the Crown nor a local authority.

H5.129 There are two bonds that meet these criteria, the bonds issued by:

- AIAL which has bonds with a A- S&P long-term credit rating and a five-year debt premium estimate of 1.75% p.a.; and
- Contact which has bonds with a BBB S&P long-term credit rating and a five-year debt premium estimate of 2.10% p.a.

H5.130 The resulting debt premium estimates from subclause 4(c) and (d) are based on a remaining term to maturity of five-years and are one credit rating notch either side of BBB+. Subclause (5)(c) requires the Commission to adjust the spreads of bonds described under subclauses 4(b) to 4(e) to approximate the spread that is likely to have been observed had the bonds in question been of the type described in subclause 4(a) (that is, a long-term credit rating of BBB+, and been issued by an EBD or GPB). Applying subclause 5(c), the AIAL debt premium estimate (1.75% p.a. at A-) would have been higher if it were rated BBB+, while both the Powerco (2.24% p.a. at BBB) and Contact (2.1% p.a. at BBB) estimates would have been

lower (if rated BBB+). In short, the three estimates would have converged on around 2.0% p.a. if rated BBB+ with a remaining term to maturity of five-years.¹⁰²⁹

H5.131 The final criteria included in the IM is subclause 4(e) which indicates that the Commission will consider bond issues that are:

- i. investment grade credit rated; and
- ii. issued by an entity that is majority owned by the Crown or a local authority.

H5.132 There are three entities with bonds that meet these criteria, the bonds are issued by:

- Transpower which has bonds with a S&P long-term credit rating of AA- and a five-year debt premium estimate of 1.16% p.a.;
- Genesis Energy which has bonds with a S&P long-term credit rating of BBB+ and a five-year debt premium estimate of 1.58% p.a.; and
- Mighty River Power which has bonds with a S&P long-term credit rating of BBB+ and a five-year debt premium estimate of 1.73% p.a.

H5.133 Clause 2.4.4(5)(a) establishes a hierarchy with progressively lesser regard being had to bonds identified in subclause (4)(b) to (4)(e), with least regard placed on 4(e). Little weight is placed on the debt premium estimates from the Transpower, Genesis Energy and Mighty River Power. These do not alter the debt estimate as they are all below the minimum debt premium estimate set by the Vector bond of 1.82% p.a.

H5.134 In this example, in estimating the five-year debt premium for a qualifying rating of BBB+ as at 1 September 2010 the Commission had primary regard to the following debt premiums estimates:

- i. On bonds specified in subclause 4(a) the minimum debt premium is 1.82% p.a.;
- ii. taking into considerations the results from bonds specified in subclause 4(c) and (d), and the adjustment required in Clause 2.4.4(5)(c), the Commission considers this information provides an appropriate debt premium estimate of 2.0% p.a. for EDB, GPB and Transpower.

Conclusion on the debt premium estimate from the worked example

H5.135 Following the EDBs IM Determination Part 2, subpart 4, clause 2.4.4 the Commission estimates an appropriate debt premium to apply to EDB, GPB and Transpower as at 1 September 2010 is 2.0%.

H6 Term Credit Spread Differential

H6.1 The cost of capital IM uses a risk-free rate and debt premium estimated over a term which matches the regulatory period. Generally, this will be a period of five years.

¹⁰²⁹ Taking a simple average of these three estimates also results in an estimated debt premium of 2.0% p.a.

- H6.2 Regulated suppliers may issue debt with a term exceeding five years to manage their refinancing risk. The issue of such debt will typically have a greater debt premium due to the longer term. Regulated suppliers who issue long term debt may also incur costs entering into interest rate swaps to reduce their initial interest rate re-pricing period from the length of the bond, to a shorter period.
- H6.3 The IM recognises the additional debt premium and the interest rate swap execution costs that can be incurred from issuing longer term debt, to the extent that such debt is issued. This will be achieved through an allowance – the term credit spread differential allowance.
- H6.4 This allowance will not be part of the WACC which applies to all regulated suppliers. Rather, it will apply only to qualifying suppliers and be treated analogously to expenses under the various instruments. That is, it will be treated as follows:
- in the context of information disclosure, the term credit spread differential allowance will be reflected in the ROI disclosed in accordance with the ID Determination;
 - given that the allowance for the term credit spread differential will be reflected in disclosed ROIs, it will also implicitly affect the way that any starting price adjustments are implemented for DPPs;
 - in the case of CPPs, the term credit spread differential is an explicit allowance in the calculation of building blocks allowable revenue. The allowance in the EDB and GPB Determinations is calculated on the assumption of a three, four or five-year term to match the CPP period.
- H6.5 The allowance applies only to regulated suppliers whose debt portfolio, as of the date of the most recent audited financial statements, has a weighted-average tenor greater than five years. For such suppliers the allowance will apply in respect of individual bond issues which have a tenor exceeding five years (‘qualifying debt issues’).
- H6.6 In respect of qualifying debt issues, the allowance represents:
- the additional credit spread over swap on long-term debt versus that on five year debt as at the date of pricing;¹⁰³⁰
 - the execution costs of an interest rate swap; and
 - a downward adjustment in relation to the annual notional debt issue costs to reflect the longer term of the qualifying debt issue.
- Each is discussed in turn.
- H6.7 The term credit spread differential is available to qualifying suppliers on their qualifying debt. Like the methodology for estimating the debt premium, the term

¹⁰³⁰ By convention, interest rate swaps reference the swap rate rather than the government bond rate.

credit spread allowance is estimated based on a BBB+ S&P long-term credit rating for EDBs, GPBs, and Transpower (and A- for airports). However, due to the limited number of long-maturity bonds (especially with maturities of around 10 years), the Commission has considered further how the term credit spread difference can best be estimated in practice. In particular, the Commission considers that the Bloomberg NZ fair value curves is a practical alternative to trying to estimate the term credit spread difference by reference to the debt premiums on individual bonds (and avoid the need to extrapolate).

H6.8 The following table sets out the estimated additional credit spread over swap (expressed in % per annum) between a tenor of 10 years and a tenor of five years, at a selection of dates in the past, for selected New Zealand publicly traded bonds, the Bloomberg NZ A fair value curve and the Bloomberg US Utility A, BBB+ and BBB fair value curves.

Table H5 Additional credit spread over swap between five-year and 10 year debt

Entity	S&P Long-term credit rating	Jun 2005	Jun 2006	Jun 2007	Jun 2008	Jun 2009	Jun 2010
Powerco	BBB	0.18%	0.15%	0.14%			
AIAL	A-		0.19%	0.16%			
Telecom	A		0.21%	0.20%			
Bloomberg NZ BFV	A		0.18%	0.16%	0.41%	0.60%	-0.05%
Bloomberg US Utility BFV	A	0.15%	0.17%	0.15%	0.22%	0.18%	0.49%
Bloomberg US Utility BFV	BBB+	0.19%	0.22%	0.15%	0.44%	0.07%	0.39%
Bloomberg US Utility BFV	BBB	0.15%	0.25%	0.19%	0.53%	0.05%	0.41%

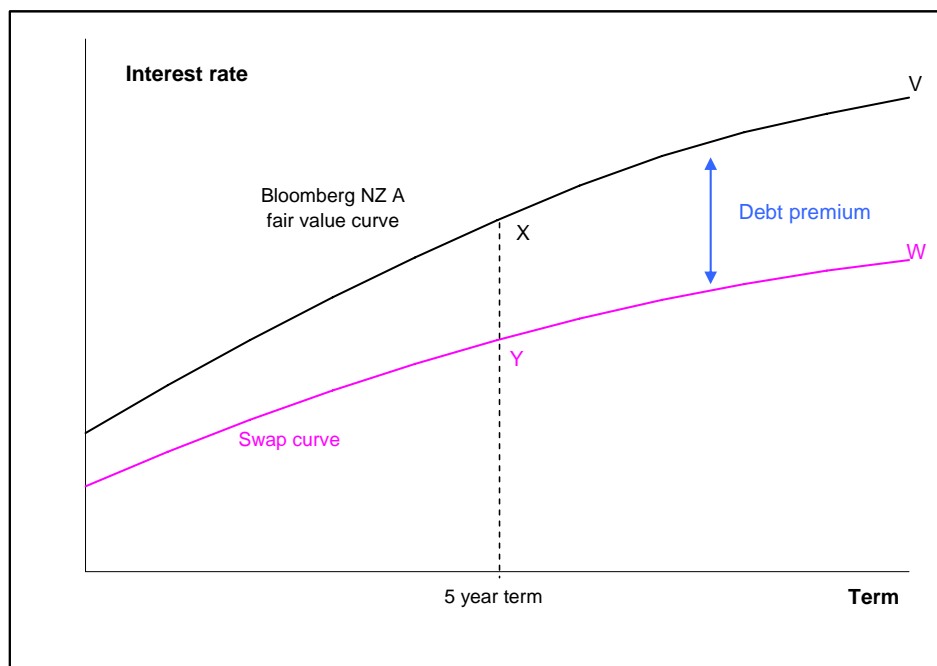
Source: Bloomberg

H6.9 As can be seen in the above table, the lack of new issuance of appropriate New Zealand publicly traded bonds since 2007 with a tenor of, for example, 10 years makes it difficult, without extrapolation, to estimate the additional credit spread over swap relative to a tenor of 10 years. In addition, the affects of the volatility associated with the GFC is apparent in the estimates from 2008 onwards.

H6.10 Bloomberg does not currently offer a New Zealand fair value curve with a S&P long term credit rating less than A. However, the estimates from the New Zealand publicly traded bonds and the Bloomberg NZ and US fair value curves shown in the table above do not suggest that there is a discernible difference in the estimate of the additional credit spread over swap related to considering debt issues with a S&P long term credit rating of BBB, BBB+, A- or A, as opposed to the target of BBB+ / A-. This suggests that the Bloomberg NZ A fair value curve is a good proxy for estimating the term credit spread differential on BBB+ / A- bonds. The IM therefore specifies that the term credit spread differential should be estimated by reference to the Bloomberg NZ A fair value curve.

H6.11 The additional credit spread over swap is the difference between the Bloomberg NZ A fair value curve, as a proxy for long-term corporate debt, and the contemporaneous swap rate for the same tenor as the EDB's or GPB's qualifying debt issue and for a tenor of five years, as at the date of pricing the long-term corporate debt issue. The graph below illustrates the spread. Specifically the additional credit spread is defined as $(V-W) - (X-Y)$ on the graph below. The Bloomberg NZ A fair value curve will be used to estimate the interest rates V and X .

Figure H6 Illustration of the term credit spread



H6.12 It is apparent in the table above that the volatility associated with the GFC is having an effect on the estimates of the additional credit spread over swap. In particular, there are some estimates which are implausibly low (for example, that the differential could be negative). This could be addressed by setting a minimum floor on the additional credit spread over swap. Setting a minimum both gives qualifying suppliers with qualifying debt a degree of certainty and also protects them on the downside from exposure to post GFC volatility. Likewise, there are some estimates which appear to be abnormal spikes, which could be addressed by setting a maximum cap on the additional credit spread over swap.

H6.13 Based on the estimates from the various data sources referenced in the table above, the Commission has set a minimum of 0.15% per annum and a maximum of 0.60% per annum for the additional credit spread over swap.

H6.14 Allowance will also be made for interest rate swap execution costs (i.e. the amount that is half of the wholesale bid and offer spread for an interest rate swap, for a notional principal amount equal to the principal amount of the debt)¹⁰³¹ on qualifying debt as at the date of pricing.

¹⁰³¹ For a more detailed description see clause 2.4.9(1) in the IM Determination.

H6.15 There will also be a re-allocation of the annual notional debt issuance costs to reflect the longer tenor of the qualifying debt issue. These costs are included in the WACC at 0.35% per annum on an assumed term of five years. Regulated suppliers that issue longer maturity debt have the greater term credit spread on such debt recognised through the term credit spread difference allowance. Such regulated suppliers will also incur debt issuance costs less frequently. Therefore the allowance for debt issuance costs needs to be re-allocated to reflect the longer debt maturity. The adjustment will reallocate the costs over the tenor of the qualifying debt issue (rather than the assumed five year term in the WACC specified in the IM Determination). This reallocation will be included in the term credit spread differential allowance, while the 0.35% allowance for issuance costs will be included in the WACC. The re-allocation of the debt issuance costs will be a negative number.

H7 TAMRP

Decision - TAMRP

- H7.1 The IM provides that the TAMRP, relative to a five-year risk-free rate, is 7%.
- H7.2 Due to the impact of the GFC on the premium for owning risky assets, the TAMRP is temporarily increased to 7.5% for the regulatory years ending in the calendar years 2010 and 2011. After this the TAMRP reverts to its long-term level of 7%.
- H7.3 The TAMRP will be expressed as a composite rate for a five year period. For example, for the year commencing 1 July 2010, the TAMRP would be 7.1% and for the year commencing 1 July 2011, it would be 7.0%.¹⁰³² Applying this approach in the context of information disclosure for the five year period commencing in April 2010 the TAMRP would be 7.1%, and for the period commencing in April 2011 it would be 7.0%. In the context of the DPP, the TAMRP for the regulatory period 2010-2015 would be 7.1%. For the CPP, the TAMRP would be 7.0%.

Commission's reasons - approach to estimating the long-term TAMRP

Overview

- H7.4 The market risk premium ('MRP') measures the additional expected return over and above the risk-free rate required to compensate investors for holding the market portfolio. It represents the premium investors can expect to earn for bearing only systematic (market) risk. The form of the MRP that is consistent with the simplified Brennan-Lally CAPM is the TAMRP. The TAMRP is neither a supplier-specific parameter nor an industry-specific parameter, but rather is common to all assets in the economy.
- H7.5 Most of the underlying data is expressed in terms of the MRP (i.e. before making the tax adjustment that is required in applying this parameter in the simplified Brennan-Lally CAPM) and, therefore, in this Reasons Paper data relating to MRP estimates

¹⁰³² A five-year TAMRP is derived as a weighted average of the years that 7.5% applies and the years 7% applies. For example, the TAMRP of 7.1% from 1 July 2010 is derived as the weighted average of one year at 7.5% and four years at 7%, (calculated by $(7.5 \times 1 + 7.0 \times (5 - 1)) \div 5$).

has been converted to the TAMRP equivalent.¹⁰³³ In the interest of brevity, the term ‘TAMRP’ is used in the text that follows except where there is specific reference to a MRP value.

H7.6 The TAMRP is not directly observable and therefore needs to be estimated. This is because:

- the TAMRP is a *ex ante* (forward-looking) concept and, as a result, reflects investors’ expectations; and
- the market portfolio itself cannot be observed as market values for many assets are not known, so it requires the use of a proxy (e.g. returns on an index of listed equities).

H7.7 In light of these factors, considerable debate remains over which of the various approaches that have been identified for estimating the TAMRP is most appropriate in a regulatory setting. This has become further complicated by the advent of the GFC, which has led to revisions about the level of risk in markets and investors’ expectations towards risk.

H7.8 In reaching an estimate for the TAMRP, the Commission has considered:

- the appropriate methodology and estimate for the TAMRP;
- applying this methodology in a regulatory context, including whether both New Zealand and foreign data should be used; and
- whether any adjustment, temporary or permanent, should be made as a result of the GFC.

Appropriate methodology for estimating the TAMRP

H7.9 In estimating the TAMRP, the Commission has assessed which of a range of possible estimation techniques to adopt. In particular, the Commission has considered:

- whether it should adopt an *ex post* (historic) or *ex ante* (forward-looking) estimate for the cost of capital, or some combination of both;

¹⁰³³ For the non-Australian estimates the MRP is related to the TAMRP by using the formula $MRP = TAMRP - R_f(T)$, where R_f is the risk-free rate of return and T is the investor tax rate (the value for investor tax rate will depend on the time period and tax assumption that the estimate is based on). For the conversion process of the Australian based MRP estimates see Lally, M., *International Comparison of Regulatory Cost of Capital for Gas Distribution Businesses*, Report to the New Zealand Commerce Commission, 28 October 2008, p. 12. Charles River Associates for Unison (see *Regulated Returns for Australian and New Zealand Electricity Distribution*, 15 August 2010, pp. 41-42) submit that the utilisation rate for the Australian based MRP conversion process should use the latest AER estimate of 0.65, rather than assume a utilisation rate of 1 which implies fully segregated markets. Dr Lally (see *Comments on Input Methodologies (EDS) Draft Reasons Paper*, 3 September 2010, pp. 7-9) notes that the AER estimate of 0.65 relies on data both prior to and subsequent to a relevant tax change in 2001, whereas the AER should only rely on data subsequent to this tax change. In addition, the AER has misinterpreted the analysis contained in a study it has relied on. Correcting for these two items, the AER’s estimate of the utilisation rate should have been 0.77, rather than 0.65. Finally, Dr Lally notes that the simplified Brennan-Lally CAPM explicitly assumes that the utilisation rate is 1 and this should extend to the estimate used in the present circumstances.

- whether it should estimate the TAMRP using arithmetic averages or geometric averages; and
- the appropriate term of the risk-free rate used in estimating the TAMRP.

Ex post approaches

- H7.10 Estimates of the expected MRP have traditionally been based on *ex post* returns. Since these returns have fluctuated significantly across countries and across time - even in terms of decades - regulators have typically used or placed weight on long-term historical estimates. Dimson, Marsh and Staunton is widely regarded by both practitioners and regulators as being one of the most authoritative sources of historical estimates.¹⁰³⁴
- H7.11 The most common *ex post* approach is to average the historical spread between market returns (i.e. the returns on a market index used to proxy the market portfolio) and risk-free rates. The most common of these is the Ibbotson (Morningstar) approach used by Dimson, Marsh and Staunton. Other *ex post* methods have been developed by Siegel¹⁰³⁵ and Merton.¹⁰³⁶
- H7.12 Siegel shows that the Ibbotson type estimate of the standard MRP is unusually high due to the very low returns on bonds during 1926-1990. Siegel adjusts the Ibbotson type estimate through adding back the historical average long-term real risk-free rate and then deducting an estimate of the expected long-term real risk-free rate.
- H7.13 Merton estimates the market risk premium as the product of an estimate of market risk and an estimate of the market risk premium per unit of market risk.
- H7.14 A key advantage of the Ibbotson *ex post* approach is that it is relatively objective and easy to interpret. Further, a conceptual justification for the use of historical estimates is that investors base expectations of the MRP on past experience. Historical premiums, however, may be poor predictors of future expected premiums. Dimson, Marsh and Staunton argue that global equity returns have exceeded expectations in the past century, and that this growth is unlikely to be repeated.¹⁰³⁷ Thus, prospective MRP estimates based on unadjusted historical averages may be biased upwards.¹⁰³⁸

¹⁰³⁴ Ofcom, *Ofcom's approach to risk in the assessment of the cost of capital*, August 2005, p. 29; Ofcom, *A new pricing Framework for Openreach*, May 2008, p. 85; Ofwat, *Future Water and Sewerage Charges 2010-2015 – Final Determination*, April 2009, pp. 128-129; Competition Commission, Review of Stansted Airport Q5 price control, October 2008, Appendix L, p. L17; Ofgem, *Electricity Distribution Price Control Review Final Proposal - Allowed Revenues and Financial Issues*, 7 December 2009, p. 12; AER, Final decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters, May 2009, pp. 191-192.

¹⁰³⁵ Siegel, J., The Equity Premium: Stock and Bond Returns since 1802, *Journal of Economic Theory*, Vol. 8, 1992, pp. 28-38.

¹⁰³⁶ Merton, R., On Estimating the Expected return on the Market. An Exploratory Investigation, *Journal of Financial Economics*, Vol. 8, 1980, pp. 323-361.

¹⁰³⁷ Dimson, E., Marsh, P. and Staunton, M., *Triumph of the Optimists: 101 Years of Global Investment Returns*, Princeton University Press, New Jersey, 2002.

¹⁰³⁸ See Dimson, E., Marsh, P. and Staunton, M., Global Evidence on the Equity Risk Premium, *Journal of Applied Corporate Finance*, Vol. 14, 2003, pp. 27-38.

- H7.15 It is possible that investors' risk preferences have changed over time, which would alter expected rates of return. Shifts in investors' tolerance of risk may be reflected in changes in stock price-to-earnings or stock price-to-dividend ratios. Dimson, Marsh and Staunton find a long-term upward trend in price-to-dividend ratios for a number of markets, and argue that such trends cannot persist in the long-run.¹⁰³⁹ Removing the contribution of these trends from historical MRP averages causes their MRP estimates to fall.
- H7.16 As financial markets deepen and become more globally integrated, the opportunities for investors to diversify their portfolio increase. This will tend to reduce the level of risk faced by investors, and therefore, the premium they expect for bearing such risk.
- H7.17 The results from Dimson, Marsh and Staunton,¹⁰⁴⁰ applying the Ibbotson methodology, appear to be the most commonly referenced estimates for the historical averages by regulators in Australia and the UK, and practitioners.¹⁰⁴¹ Ofcom's view is that the work carried out by Dimson, Marsh and Staunton is widely regarded as being one of the most 'authoritative sources' of historical estimates.¹⁰⁴² One of the reasons for this is that Dimson, Marsh and Staunton address key methodological problems that previous research on the MRP had failed to deal with, such as survivorship bias.¹⁰⁴³
- H7.18 The reliability of estimates based on historical averages relies on the quality and availability of the underlying data. If only a relatively short time series is available, the resulting MRP estimates are likely to be statistically imprecise. However, adopting too long a series in an attempt to improve the precision of the MRP estimates increases the possibility of including data from periods that are less relevant to the current period.¹⁰⁴⁴
- H7.19 In advice on the appropriate TAMRP on the Gas Authorisation, Dr Lally considered results from Credit Suisse First Boston¹⁰⁴⁵ and Boyle¹⁰⁴⁶ who had used the Merton methodology to estimate the MRP.¹⁰⁴⁷ Boyle concluded that the results from his

¹⁰³⁹ *ibid.*

¹⁰⁴⁰ This data first appeared in Dimson, E., Marsh, P. and Staunton, M., *Triumph of the Optimists: 101 Years of Global Investment Returns*, Princeton University Press, New Jersey, 2002. Since then Dimson, Marsh and Staunton have published the results in an annual Global Investments Return Yearbook.

¹⁰⁴¹ Regulators that have referenced Dimson, Marsh and Staunton estimates for the MRP in recent decisions involving the cost of capital include: AER, Ofwat, Ofcom, Ofgem.

¹⁰⁴² Ofcom, *Ofcom's approach to risk in the assessment of the cost of capital*, August 2005, p. 29; Ofcom, *A new pricing Framework for Openreach*, May 2008, p. 85.

¹⁰⁴³ Survivorship bias is the tendency for companies that no longer exist due to failure, takeovers etc., to be excluded from performance studies because the data on them is no longer collected as they no longer exist.

¹⁰⁴⁴ For example, MRP estimates are available for the US using data from as far back as the 1800s. These estimates may have low standard errors due to the large sample they draw on, but because financial markets have changed so significantly since the early years of that sample the results are likely to be biased estimates of future expected premiums.

¹⁰⁴⁵ Credit Suisse First Boston, *Equity Valuation Methodology*, 1998.

¹⁰⁴⁶ Boyle, G., Risk, Expected return, and the cost of equity capital. *New Zealand Economic Papers*, Vol. 39, 2005, pp. 181-194.

¹⁰⁴⁷ Lally, M., *The weighted average cost of capital for electricity lines businesses*, September 2005, p. 12-13; Lally, M., *The weighted average cost of capital for gas pipeline businesses*, 28 October 2008, pp. 18-19.

analysis could not be relied on. In advice on the Gas Authorisation Dr Lally noted that:¹⁰⁴⁸

The apparent source of the problem here is that the variance shifts unpredictably over time and the market risk premium is based upon the *expected* future variance rather than past actual variance. Since actual variance fluctuates much more than expected variance, Boyle's range overestimates the true variation across time in the market risk premium. Clearly the use of a very long period for estimating future variances would be inconsistent with the presumption of intertemporal variations that underlies this methodology.

H7.20 Dr Lally further noted that the Credit Suisse First Boston results faced similar conceptual difficulties and concluded that the results from Merton-type estimates should be excluded from the final estimation of the TAMRP.

H7.21 Whilst Merton has a sound theoretical foundation, it has also been viewed as one of the least robust methods empirically because of the significant standard errors associated with the estimated results. Consequently, the Commission places no weight on the resulting Merton *ex post* estimates in its decisions following Dr Lally's recommendation.¹⁰⁴⁹

Ex ante approaches

H7.22 Using a forward-looking or *ex ante* approach to estimate the MRP is consistent with the MRP in theory being an *ex ante* measure. Among the *ex ante* approaches¹⁰⁵⁰ are the DCF model and the results from surveys of academics and practitioners. The approaches have their own drawbacks.

H7.23 There are a number of well known limitations with the DCF model, which were previously noted under the Overall Approach (see Appendix H2). Some of these limitations which are relevant to estimating an *ex ante* MRP are:

- good forecasts of dividend growth are essential;
- dividend growth forecasts, which are generally only available for the short-run, often exceed the long-run rate of economic growth; and
- the models rely on the assumption that financial markets are efficient and correctly value investments at all times.

H7.24 Survey evidence can be subjective and difficult to interpret. For example, the results may suffer from non-response bias and questions, no matter how carefully crafted, either might not be properly understood or might not elicit the correct response. These issues might result in an upward or downward bias in responses. An example of this was referred to in advice to the Commission where Dr Lally assessed an estimate of the market risk premium from survey evidence and noted that the results

¹⁰⁴⁸ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, 28 October 2008, p. 18.

¹⁰⁴⁹ See for example Commerce Commission, *Electricity Distribution - Regulation of Electricity Lines Businesses Targeted Control Regime - Intention to Declare Control Unison Networks Limited*, September 2005; and Commerce Commission, *Gas Authorisation Decisions Paper*, 30 October 2008.

¹⁰⁵⁰ Although described here as forward-looking, the *ex ante* approaches mentioned here do, strictly speaking, draw on historical data. Specifically, analysts' earnings and growth forecasts used in the DCF model, and survey respondents' future expectations, would typically be informed by past experience.

for at least one group (practitioners) may be biased upwards due to some responses mistakenly supplying an estimate of the TAMRP rather than the MRP.¹⁰⁵¹

Conclusion - ex post versus ex ante approaches for estimating the TAMRP

H7.25 In light of the above discussion, both *ex post* and *ex ante* approaches are used to estimate the TAMRP for the IM.

H7.26 All Expert Panel members advised that evidence from the *ex ante* and *ex post* looking approaches should be considered. However, the experts did not agree on the weight that should be given to each approach.¹⁰⁵² Submitters generally agreed that both approaches should be considered by the Commission when determining the TAMRP, but that greatest weight be placed on the *ex post* results.¹⁰⁵³ However, CIAL submitted that standard practice is to use only *ex post* results.¹⁰⁵⁴

H7.27 The weighting placed on each approach is a matter of judgment for the Commission, which requires taking into account all the available evidence, and current market circumstances. For instance, if due to the GFC the world were considered a more risky place in the medium or longer term, then additional weight may need to be put on forward-looking estimates. Further consideration is given to the GFC later in this section.

H7.28 In summary, to estimate the TAMRP the Commission relied on *ex post* Ibbotson-type estimates undertaken by Dimson, Staunton and Marsh, the Siegel approach, as well as *ex ante* estimates. The Commission excluded the Merton estimates from its consideration.

Estimating the TAMRP using arithmetic averages versus geometric averages

H7.29 When the TAMRP is estimated by taking the difference between market returns and the risk-free rate, a question can arise as to whether this process should be based on arithmetic or geometric averages.

H7.30 The choice can have a material effect on the estimated TAMRP, as the arithmetic average can be of the order of 2% above the geometric average.

H7.31 As the arithmetic approach results in a higher TAMRP estimate compared to the geometric approach, a preference for the former represents a favourable decision from the view point of suppliers.

H7.32 Although the Commission has not explicitly discussed the matter in previous decisions, the Commission has used a TAMRP estimate that was based on an arithmetic average. BARNZ considered the use of the arithmetic average over the

¹⁰⁵¹ Commerce Commission, *Gas Control Inquiry*, Final Report, 29 November 2004, pp. 12-13.

¹⁰⁵² Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, Report prepared for the Commerce Commission, 18 December 2008, pp. 21-22.

¹⁰⁵³ Maui Development Limited, *Submission on the Input Methodologies Discussion Paper*, July 2009, p. 19; Powerco Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: PricewaterhouseCoopers, *Commerce Commission's Revised Draft Guidelines and aspects of the Input Methodologies Discussion Paper relating to Cost of Capital prepared for Powerco Limited*, 14 August 2009, p. 14; PricewaterhouseCooper, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, pp. 9-10.

¹⁰⁵⁴ Christchurch International Airport Limited, *CIAL Submission on Revised Draft Guidelines*, 3 August 2009, p. 2.

geometric average was another example of the Commission taking what was a favourable decision from the point of view of suppliers'.¹⁰⁵⁵ In cross-submissions, Uniservices (for NZAA), disagreed with BARNZ, submitting that the Commission was not adopting a position favourable to suppliers in its choice of the arithmetic as opposed to the geometric average in the determination of the TAMRP.¹⁰⁵⁶

- H7.33 In setting the TAMRP for the IM, the Commission has continued to use a TAMRP estimate based on an arithmetic average. The Commission notes Dr Lally advised that using an arithmetic average generates a value for the regulated service that is expected to match the initial investment. On the other hand, using a geometric average generates a value for the regulated service that is expected to be less than the initial investment.¹⁰⁵⁷ The arithmetic approach is used by most other regulators when estimating the MRP although The UK Competition Commission and the UK CAA use geometric averages. The geometric MRP estimates range from 2.5% to 4.5%,¹⁰⁵⁸ whereas arithmetic estimates are typically between 4% and 5.4%.

Term of the risk-free rate used in estimating the TAMRP

- H7.34 The risk-free rate features in three places in the cost of capital calculation (in the cost of debt estimation, the first term of the CAPM and in the estimation of the TAMRP). It is explicitly part of both the cost of debt and the cost of equity. In addition, the risk-free rate is also an implied component of the TAMRP (which measures, as outlined above, the additional expected return over and above the risk-free rate required to compensate investors for holding the market portfolio).
- H7.35 Appendix H4 discusses the appropriate term of the risk-free rate and that the term of the risk-free rate in the cost of debt and the cost of equity is matched to the term of the regulatory period.
- H7.36 There is ongoing debate among practitioners and academics concerning what the term(s) of the risk-free rate in the cost of equity calculation should be. As part of the Expert Panel, Professor Myers and Professor Franks recommended that the Commission employ one risk-free rate in its cost of equity calculation. Dr Lally recommended that the Commission define the TAMRP relative to the average interval (across investors) between portfolio reassessments and define the term of the risk-free rate within the cost of equity calculation to match the regulatory period, even if this leads to the use of two different risk-free rates within the cost of equity.

¹⁰⁵⁵ Board of Airline Representatives New Zealand Inc, Submission on Commerce Commission Input Methodologies (Airport Services) Draft Reasons Paper and Draft Determination, 12 July 2010, p. 17.

¹⁰⁵⁶ NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, Attachment: Uniservices, *Comments on Air New Zealand's and Board of Airline Representatives New Zealand Incorporated's Submissions to the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper: report prepared for New Zealand Airports Association*, 3 August 2010, p. 12.

¹⁰⁵⁷ Lally, M., *Comments on Input Methodologies (EDS) Draft Reasons Paper*, 3 September 2010, p. 2.

¹⁰⁵⁸ On the cost of capital, the UK Civil Aviation Authority takes the UK Competition Commission's advice on the generic elements (i.e. the risk-free rate and the MRP). In the Competition Commission's report it used a range of 2.5-4.5% on a geometric basis CAA, *Heathrow/Gatwick quinquennial review - Final report*, 3 October 2007, Appendix F; CAA, *Airport Regulation Economic Regulation of Stansted Airport 2009-2014 – CAA Decision*, March 2009, Appendix L.

- H7.37 A number of submitters agreed that the term of the risk free rate should be consistent throughout the cost of capital IM and as a majority of these indicated, through their submissions on the risk-free rate, that the appropriate term would be 10 years.¹⁰⁵⁹
- H7.38 In a submission on the Draft Reasons Papers PwC (for ENA) and Uniservices (for NZAA) agreed that the term of the risk-free rate in the TAMRP should match the term of the regulatory period (regulated suppliers considered this term should be 10 years).¹⁰⁶⁰
- H7.39 At the Cost of Capital Workshop and in post workshop submissions PwC stated that their estimate of 7.5% for the New Zealand TAMRP had been primarily based on analysis it undertook of historical realised returns in the New Zealand market measured relative to ‘short-term’ government bonds with a term to maturity of one to three years.¹⁰⁶¹ However, although PwC uses a term of five years for the risk-free rate in its quarterly cost of capital publication in conjunction with its TAMRP estimate, it submitted that the Commission should use a term of 10 years for the risk-free rate consistently across the cost of capital.¹⁰⁶²

Conclusion - term of the risk-free rate used in estimating the TAMRP

- H7.40 The Commission has set the term of the risk-free rate equal to the term of the regulatory period, typically five years. Using a term of five years for the risk-free rate in estimating the TAMRP ensures consistency.
- H7.41 Given that regulatory periods can be from three to five years under Part 4 price-quality regulation, this would imply multiple TAMRP estimates may be required.
- H7.42 In previous decisions, the Commission has used an estimate of the TAMRP relative to the 10 year risk-free rate. The IM continues its the approach of a single TAMRP covering all lengths of regulatory period. However, the TAMRP in the IM has been calculated against a five-year risk-free rate, rather than a 10 year rate. This ensures there is a single risk-free rate used in estimating the TAMRP and that it (generally) matches the term of the regulatory period.

¹⁰⁵⁹ Powerco Limited, Input Methodologies Discussion Paper, 14 August 2009, p. 28; Powerco Limited, Submission on the Input Methodologies Discussion Paper, Attachment: PricewaterhouseCoopers, Commerce Commission’s Revised Draft Guidelines and aspects of the Input Methodologies Discussion Paper relating to Cost of Capital prepared for Powerco Limited, 14 August 2009, p. 12; Auckland International Airport Limited, *Submission to the Commerce Commission Draft WACC Guidelines Paper*, 31 July 2009, p. 2; LECG, Comments on the Commerce Commission’s proposed approach to estimating the cost of capital, Report for NZAA, 31 July 2009, p. 27; PricewaterhouseCooper, Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission’s Approach to Estimating the Cost of Capital, Report on behalf of 17 EDBs, 14 August 2009, p. 17; Telecom, *Annex B: Submission on Commerce Commission Revised Draft Guidelines for estimating the Cost of Capital*, August 2009, Annex B; Commerce Commission, Cost of Capital Workshop Transcript, pp. 175-176.

¹⁰⁶⁰ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission’s Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, p. 18.

¹⁰⁶¹ Commerce Commission, Cost of Capital Workshop Transcript, p. 178 and PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, Report for 17 EDBs, 2 December 2009, p. 17.

¹⁰⁶² PricewaterhouseCoopers, *The Cost of Capital Report*: As at 30 June 2010. This report and previous reports can be obtained from PwC New Zealand web site (<http://www.pwc.com/nz/en/cost-of-capital>).

H7.43 The Commission considers there is no case for changing its TAMRP estimate on a regular basis. This is similar to the practice of many advisors who do not regularly change their estimate of the TAMRP. For example, PwC has not publicly updated its estimate of TAMRP since 2002.

Commission’s reasons - the long-term TAMRP estimate

H7.44 In setting the TAMRP, the Commission considered its previous regulatory decisions (as the parameter is a long-term estimate), evidence from studies of forward and backward-looking TAMRP estimates, advice from the expert panel, evidence provided by submitters, market risk premium estimates used by overseas regulators, and the impact of the GFC.

Previous estimates of the TAMRP used by the Commission

H7.45 The Commission has estimated a TAMRP in a number of previous regulatory decisions. These are summarised in Table H6 below.

Table H6 Estimates of the TAMRP used by the Commission

Decision	Year of Decision	TAMRP Estimate
Airports Inquiry ¹⁰⁶³	2002	8%
TSO determinations - 2001-2002	2003	8%
TSO determinations - 2002-2003 onwards	2005 - 2008	7%
Gas Control Inquiry ¹⁰⁶⁴	2004	7%
Unison Post-breach Inquiry ¹⁰⁶⁵	2007	7%
Gas Authorisation ¹⁰⁶⁶	2008	7%

H7.46 The table above illustrates that the Commission has adopted TAMRP estimates of either 7% or 8%. In all decisions after 2003, the Commission has adopted a TAMRP estimate of 7%.

H7.47 In the context of the Airports Inquiry, Dr Lally generated TAMRP estimates in the range of 7% to 9% using both *ex post* and *ex ante* approaches.¹⁰⁶⁷ No approach to estimating the TAMRP was considered by the Commission to be necessarily better than any other. Having considered submissions and advice from Dr Lally, the Commission’s view was to adopt a TAMRP of 8%, within a range of 7% to 9%, in recognition of the uncertainty surrounding the estimate.

H7.48 In the report prepared for the Commission in the Gas Authorisation in 2008, Dr Lally adopted a similar approach as for the Airports Inquiry (in that he used both *ex*

¹⁰⁶³ Commerce Commission, *Part IV Inquiry into Airfield Activities at Auckland, Wellington and Christchurch International Airports*, Final report, 2002.

¹⁰⁶⁴ Commerce Commission, *Gas Control Inquiry*, Final Report, 29 November 2004.

¹⁰⁶⁵ Commerce Commission, *Regulation of Electricity Lines Businesses - Targeted Control Regime - Reasons for Not Declaring Control - Unison Networks Limited*, 11 May 2007, pp. 38-39.

¹⁰⁶⁶ Commerce Commission, *Gas Authorisation Decisions Paper*, 30 October 2008.

¹⁰⁶⁷ Lally, M., *The cost of capital for the airfield activities of New Zealand’s international airports*, November 2001 (Lally, WACC for Airports).

post and *ex ante* approaches to generate TAMRP estimates), but relied on updated evidence where it was available. He reviewed estimates of the TAMRP using *ex post* approaches of the Morningstar (Ibbotson) and Siegel types; the constant reward to risk methodology of Merton, *ex ante* approach of Cornell; and survey evidence, based on information from both New Zealand and foreign markets.¹⁰⁶⁸ On this basis Dr Lally favoured an estimate of 7% for the TAMRP. Table H7 displays the results from Dr Lally's advice.

Table H7 Estimates of the TAMRP by Lally 2008 - implying a 10 year term for the risk-free rate

Methodology	NZ	US	Other	All
Ibbotson	7.70%	8.40%	8.20%	
Siegel	6.40%	7.30%	6.60%	
Cornell	5.40%	6.60%		
Survey	8.00%	5.70%		
Median	7.05%			6.95%
Mean	6.88%			7.03%

H7.49 Across the entire set of results, the range for the TAMRP is 5.4% to 8.4% with a median of 6.95% and a mean of 7.03%.

Changing the estimate to represent a five-year TAMRP

H7.50 The TAMRP estimates displayed in Table H7 are estimated based on a term for the risk-free rate of 10 years. As outlined above, in the context of regulation under Part 4, the Commission considers that the appropriate term for the risk-free rate is five years. Table H8 displays the result for the TAMRP estimates based on advice provided to the Commission by Dr Lally in 2008¹⁰⁶⁹ updated for a five year term for the risk-free rate.

Table H8 Estimates of the TAMRP by Lally 2008 - implying a five year term for the risk-free rate

Methodology	NZ	US	Other	All
Ibbotson*	7.70%	8.40%	8.20%	
Siegel*	6.40%	7.30%	6.60%	
Cornell	5.20%	6.80%		
Survey	8.20%	6.20%		
Median	7.05%			7.05%
Mean	6.88%			7.10%
* The Ibbotson and Siegel estimates in this table are for a 10-year risk-free rate term not a 5-year term.				

¹⁰⁶⁸ For a more detailed analysis see Lally, M., *The weighted average cost of capital for gas pipeline businesses*, 28 October 2008, pp. 16-38.

¹⁰⁶⁹ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, 28 October 2008, pp. 24-25.

- H7.51 The results in the above table for the Ibbotson and Siegel-type estimates remain unchanged as Dr Lally did not convert these estimates into an estimate relative to a five year term for the risk-free rate.
- H7.52 However, the difference between the average five year and 10 year risk-free rate approximated using New Zealand government bonds covering the period 1985 – 2008 is 8.97% and 8.89% respectively. The TAMRP estimated using a five-year risk-free rate is therefore 0.08% higher than that estimated using the 10 year risk-free rate.
- H7.53 This suggests that Ibbotson and Siegel-type estimates of the TAMRP for New Zealand would be slightly lower assuming a five year rather than a 10 year term for the risk-free rate.
- H7.54 The difference between the average five year and 10 year risk-free rate approximated using US government bonds covering the period 1962 – 2008 is 6.82% and 7.04% respectively. This results in the five-year risk-free rate being lower than the 10 year risk-free rate by 0.22%.
- H7.55 This suggests that Ibbotson and Siegel-type estimates of the TAMRP for the US would be higher.
- H7.56 To ensure consistency between the TAMRP and the term of the risk-free rate Table H8 is restated to reflect a risk-free rate term of five-years for the New Zealand and US Ibbotson estimates.

Table H9 Estimates of the TAMRP for 2008 - implying a five year term for the risk-free rate

Methodology	NZ	US	Other	All
Ibbotson*	7.62%	8.84%	8.20%	
Siegel*	6.40%	7.30%	6.60%	
Cornell	5.20%	6.80%		
Survey	8.20%	6.20%		
Median	7.01%	7.05%	7.40%	7.05%
Mean	6.86%	7.29%	7.40%	7.14%
* The Ibbotson estimate for “Other” and Siegel estimates in this table are for a 10-year risk-free rate term not a 5-year term. It is not possible to adjust the Ibbotson estimate for “Other” due to the lack of a suitable proxy. It is not possible to adjust the results from the Siegel method due to the lack of a term structure for inflation-proof bonds.				

- H7.57 This results in the average TAMRP for New Zealand of 6.86% and an average TAMRP from all estimates of 7.14%.¹⁰⁷⁰

¹⁰⁷⁰ The adjustment to the TAMRP for the US is estimated by using the conversion $MRP = TAMRP - R_f(T)$, where R_f is the contemporaneous five-year risk-free rate of return and T is the contemporaneous investor tax rate (33%). In this formula the MRP is also adjusted to represent a five-year MRP estimate rather than a 10 year MRP estimate. The New Zealand risk-free rate is obtained from Bloomberg and is the average for the month of December 2007.

Conversion of US Ibbotson estimate to five-years

- H7.58 In its submission on the Draft EDBs Reasons Paper and using data from 1931 to 2010, PwC (for ENA) and PwC (for Telecom) estimates the adjustment to the 10 year TAMRP to convert to a five-year TAMRP was 0.04% and using data from 1962 to 2010 estimated the US difference at 0.08%.¹⁰⁷¹ Updating the Ibbotson estimates for New Zealand and the US resulted in a mean TAMRP of 7.11%.
- H7.59 PwC submitted that the effect of the Commission’s revision of the term of the risk-free rate used in estimating the TAMRP from 10 to five-years suggested that the estimated TAMRP should be increased by 0.1% to 7.1%.¹⁰⁷²
- H7.60 However, the results from the PwC analysis concerning the period for the adjustments are not consistent with the data in Table H8 or Table H9. These tables provide evidence based on Dr Lally’s 2008 advice not 2010.
- H7.61 Further, in advice to the Commission on PwC’s analysis, Dr Lally considered that precision down to the level of 0.1% was not possible with respect to the expected TAMRP and therefore continued to favour rounding to a higher unit of measure. Accordingly, the appropriate rounded value for the expected TAMRP remains at 7%.¹⁰⁷³
- H7.62 The Commission notes that that in its published paper on the New Zealand TAMRP, PwC state that their estimate of the TAMRP is rounded to the nearest 0.5% i.e.

Raw US MRP	6.30%
Adjustment for difference between US five-years and 10 year risk-free rate	0.22%
NZ Investor Tax Rate	33%
NZ five-year risk-free rate	7.02%
TAMRP	8.84%

¹⁰⁷¹ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission’s Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, pp. 41-42; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission’s Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, pp. 40-41.

¹⁰⁷² Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission’s Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, pp. 41-42; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission’s Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, pp. 40-41; Electricity Networks Association, *Cost of Capital Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, Attachment: PricewaterhouseCoopers, *Report: prepared for Electricity Networks Association*, 3 September 2010, p. 41.

¹⁰⁷³ Lally, M., *Comments on Input Methodologies (EDS) Draft Reasons Paper*, 3 September 2010, p. 4.

PwC's submission to the Commission to alter the TAMRP by 0.1% is at variance with their own approach.¹⁰⁷⁴

- H7.63 Considering the factors discussed above, the Commission considers that an overall long-term TAMRP estimate of 7% is appropriate when using a five-year risk-free rate to estimate the TAMRP.

Expert Panel's view – TAMRP estimate

- H7.64 The Expert Panel recommendation on the TAMRP was that the Commission's estimate of 7% (for the simplified Brennan-Lally CAPM) was reasonable.¹⁰⁷⁵

Views of submitters – TAMRP estimate

- H7.65 In submissions on the RDG and IMs users of regulated services, Air NZ, BARNZ and MEUG, agreed that the Commission's estimate of 7% for the TAMRP was appropriate.¹⁰⁷⁶ Transpower submitted that the TAMRP should be 7% in normal conditions.¹⁰⁷⁷

- H7.66 Suppliers of regulated services disagreed with the Commission's use of 7% as the estimate of the TAMRP and indicated that the Commission's estimate was too low.¹⁰⁷⁸ Some of these submitters contended that the TAMRP proposed by the

¹⁰⁷⁴ PricewaterhouseCoopers, *New Zealand Equity Market Risk Premium*, September 2002, p. 10.

¹⁰⁷⁵ Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, Report prepared for the Commerce Commission, 18 December 2008, pp. 13-17.

¹⁰⁷⁶ Air New Zealand Limited, *Submission on the Input Methodologies Discussion Paper*, 31 July 2009, p. 70; Board of Airline Representatives New Zealand Inc, *Submission on Commerce Commission Input Methodologies Discussion Paper*, 31 July 2009, p. 58; Board of Airline Representatives New Zealand Inc, *Submission on Airports Draft Reasons Paper and Draft Determination - Effect of valuation date*, 12 July 2010, p. 10; Major Electricity Users' Group, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, Appendix, p. 3.

¹⁰⁷⁷ Transpower New Zealand Ltd., *Submission on Transpower (Input Methodologies) Draft Reasons Paper, Cost of Capital Decisions*, August 2010, p. 11.

¹⁰⁷⁸ NZ Airports Association, *Submission on the Input Methodologies Discussion Paper*, 31 July 2009, p. 80; Auckland International Airport Limited, *Submission on the Input Methodologies Discussion Paper*, 7 August 2009, p. 75; Wellington International Airport Limited, *Submission to the Commerce Commission on Input Methodologies*, 7 August 2009, p.59; Christchurch International Airport Limited, *Submission on the Input Methodologies Discussion Paper*, 7 August 2009, p. 27; Christchurch International Airport Limited, *CIAL Submission on the Revised Draft Guidelines*, 3 August 2009, p. 4 ; NZ Airports Association, *Submission on the Input Methodologies Discussion Paper*, Attachment: LECG, *Comments on Commerce Commission Input Methodologies Discussion Paper prepared for NZ Airports Association*, 31 July 2009, pp. 26-27; Unison Networks Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: Castalia Strategic Advisors, *Submission on Input Methodologies: Regulatory Cost of Capital: a report prepared for Unison Limited*, 13 August 2009, pp. 8-9; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report on behalf of ENA, 11 August 2009, pp. 17-18; Maui Development Limited, *Submission on the Input Methodologies Discussion Paper*, July 2009, p. 19; Powerco Limited, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009, pp. 29-30; Powerco Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: PricewaterhouseCoopers, *Commerce Commission's Revised Draft Guidelines and aspects of the Input Methodologies Discussion Paper relating to Cost of Capital prepared for Powerco Limited*, 14 August 2009, pp. 14-17; PricewaterhouseCooper, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, pp. 9-10; Vector Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: Synergies Economic Consulting, *Initial Weighted Average Cost of Capital Review: prepared for Vector Limited*, 14 August 2009, pp. 35-43; Telecom, *Annex B: Submission on Commerce Commission Revised Draft Guidelines for estimating the Cost of Capital*, August 2009, Transpower, *Submission to the Commerce Commission on: Transpower Process and Recommendation Discussion paper, Input Methodologies Discussion Paper*, August 2009; Annex B; Transpower, *Submission to the Commerce Commission on: Transpower Process and Recommendation Discussion paper Input Methodologies Discussion Paper*, August 2009, pp. 25-27; Unison, *Appendix: Submission on Revised Draft Guidelines: The Commerce Commission's Approach to Estimating the Cost of Capital*, 14 August 2009, Appendix, p. 7; Vector Limited, *Submission on Input Methodologies Discussion Paper*, 14 August 2009, p. 91; Commerce Commission, *Cost of Capital Workshop Transcript*, pp. 88-96;

Commission should be in the range of 7.5% to 8% based on the estimates they use. However, the majority of the submitters did not provide any information on the approach that their TAMRPs were based on.

- H7.67 Officer and Bishop (for Transpower), using historical data estimated an MRP for New Zealand under normal conditions in the range of 6%-8%.¹⁰⁷⁹ However, Officer and Bishop considered that the MRP is not constant and properly cannot be adequately represented by a stable distribution.
- H7.68 Officer and Bishop do not provide persuasive evidence that the long-term forward looking TAMRP is likely to be substantially above the long-term historical TAMRP.

Electricity Networks Association, *Cross submission on the cost of capital workshops*, 2 December 2009, pp. 11-12; Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital*, Report for NZAA, 2 December 2009, p. 41; PricewaterhouseCooper, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, Report for 17 EDBs, 2 December 2009, pp. 14-15; Telecom Limited, *Post-workshop Submission on the Cost of Capital*, Attachment: PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, 2 December 2009, p. 14; PricewaterhouseCooper, *Commerce Commission WACC Conference: Submission on Behalf of Powerco*, 2 December 2009, p. 13; Christchurch International Airport Ltd., *Submission on Input Methodologies and Information Disclosure Draft Determinations and Reasons Papers for Airport Services*, 12 July 2010, pp. 41-42; NZ Airports Association, *Submission on Draft Information Disclosure Determination and Draft Reasons Paper*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper - Report for NZAA*, 12 July 2010, p. 31; Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, pp. 42-45; Electricity Networks Association, *Cost of Capital Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, 3 September 2010, p. 2; Electricity Networks Association, *Cost of Capital Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Attachment: PricewaterhouseCoopers, Report: prepared for Electricity Networks Association*, 3 September 2010, pp. 10-13; Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: LECG, *Response to Commerce Commission's Draft Cost of Capital Input Methodology: a report prepared for the Electricity Networks Association*, 13 August 2010, p. 16; Electricity Networks Association, *Cost of Capital Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, 3 September 2010, p. 2; Powerco Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, pp. 13-14; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, pp. 15-16; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, pp. 38-45; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, 13 August 2010, p. 35; Vector Limited, *Cross Submission on Cost of Capital (Input Methodologies) Draft Reasons Paper*, 3 September 2010, p. 3; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 24-30; Wellington Electricity Lines Limited, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper, Draft Cost of Capital Input Methodology Decision*, 13 August 2010, p. 11; KPMG, *Cross-Submission on GPBs (Input Methodology) Draft Reasons Paper, Cost of Capital*, 13 August 2010, p. 15.

¹⁰⁷⁹ Officer and Bishop based the New Zealand MRP of Australia data as they considered the Australian market to be comparable. See Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Officer R. and Bishop S., *Independent Review of Commerce Commission WACC proposals for Transpower*, 5 August 2010, pp. 14-15.

- H7.69 In its submission on the EDB Draft Reasons Paper PwC (for ENA) and PwC (for Telecom) submits that some of the estimates were outdated¹⁰⁸⁰ and TAMRP estimates of the Siegel and Cornell type should be excluded on the grounds of being ad hoc and outdated respectively.¹⁰⁸¹
- H7.70 Dr Lally noted that whilst PwC argue that Siegel type estimates should be excluded on the grounds of being ad hoc, PwC later argues that the estimated TAMRP should be adjusted for the GFC, which amounts to making an ad hoc adjustment. With respect to Cornell type estimates, Dr Lally observes these estimates should be updated not excluded. He notes that PwC has updated the US survey-based estimates but that in updating them PwC itself has not made use of the most up to date version of the surveys referenced. In addition, PwC has not updated the Ibbotson type estimates. Correcting for these items, Dr Lally concluded that the PwC submission does not support a current estimate for the expected TAMRP of 8.0%.¹⁰⁸²
- H7.71 The New Zealand advisors using a 7.5% estimate of the expected TAMRP appear to rely on research on the New Zealand TAMRP undertaken by PwC. At the Cost of Capital Workshop, PwC confirmed that their TAMRP estimate of 7.5% was measured relative to 'short-term' government bonds with a term to maturity of one to three years and that the TAMRP estimate would be lower if assessed against long-term bonds.¹⁰⁸³ This implies PwC's TAMRP estimate of 7.5% would be lower if estimated against a five-year risk-free rate.
- H7.72 The Commission understands that PwC's research in support of its 7.5% estimate of the TAMRP was last publicly updated in 2002,¹⁰⁸⁴ and therefore itself is somewhat dated. It relies solely on historical estimates of the New Zealand expected TAMRP (with no consideration of forward-looking estimates nor of data from overseas).
- H7.73 If PwC were to update its own research on the New Zealand TAMRP, based on the performance of the New Zealand share market since the end of June 2002 (the stated end date of PwC's research) the Commission estimates that the resulting TAMRP estimate would be approximately 0.5% lower, i.e. if PwC's unrounded estimate versus short-term bonds in 2002 had been 7.5% then the updated unrounded estimate of a five-year risk-free rate would be approximately 7.0%. Such a result is in line with the Commission's TAMRP estimate of 7%.

¹⁰⁸⁰ The Commission notes that PwC did update the survey evidence but did not update the Ibbotson estimates. The Commission provided the most recent Ibbotson estimates in the EDBs Draft Reasons Paper, Table 6.12, p. 276.

¹⁰⁸¹ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, p. 42; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, p. 41.

¹⁰⁸² Lally, M., *Comments on Input Methodologies (EDS) Draft Reasons Paper*, 3 September 2010, pp. 4-7.

¹⁰⁸³ Commerce Commission, *Cost of Capital Workshop Transcript*, pp. 89 and 177-178.

¹⁰⁸⁴ PricewaterhouseCoopers, *New Zealand Equity Market Risk Premium*, September 2002.

Updating the TAMRP for 2010

H7.74 Table H10 summarises what advisors indicated at the Cost of Capital Workshop was their current advice on the TAMRP to clients (November 2009).

Table H10 Summary of Workshop Advisors Current TAMRP Advice to Client

Organisation	TAMRP Recommendation
KPMG	7.75%
Ireland, Wallace and Associates (Mr Ireland)	7.5%
Uniservices (Dr. Marsden)	7.5%
LECG (Prof Van Zijl)	7.5%
PwC NZ (Mr Redmayne)	7.5%
PwC Aus (Mr Balchin)	7.5%
NZIER (Dr Layton)	7%
Synergies Economic Consultancy (Professor Bowman)	9%

H7.75 The Commission does not consider this informal survey to be the best indicator of the estimated TAMRP in New Zealand. In particular, the sample at the Cost of Capital Workshop was very small, it was not randomly selected – most of the responses were selected by regulated suppliers, and it is not representative of the range of views on the prevailing estimated TAMRP in New Zealand. For example, the informal survey excludes all of the major investment banks in New Zealand, yet they are major and significant players in actually raising debt and equity finance for many firms. The Commission notes the New Zealand investment banks have current TAMRP estimates ranging between 6.5% and 7.25% as shown in Table H11 below.

Table H11 Summary of TAMRP estimate used by New Zealand Investment Banks

Investment Bank	TAMRP estimate used
Deutsche Bank / Craigs Investment Partners	6.5% (plus separate recognition for imputation credits)
Goldman Sachs	6.8%
Forsyth Barr	7%
UBS	7%
Macquarie Bank	7%
First NZ Capital	7.25% (uplifted from a normal 7% after the GFC)

H7.76 The Commission has updated the analysis undertaken in the Gas Authorisation where possible, in particular it has updated the Ibbotson estimate and survey

evidence reported in Table H9 (e.g. 2010 Ibbotson estimates from Dimson, Marsh and Staunton and new survey evidence from the US).¹⁰⁸⁵

- H7.77 The Commission estimated that the New Zealand five-year long-run average risk-free rate is 0.03% higher than the New Zealand 10 year average risk-free rate using data covering the period 1985 – 2010 (five-year estimate of 8.64% and 10 year estimate of 8.61% respectively). Using data from 1931 to 2010, PwC (for ENA and for Telecom) estimated that the five-year risk-free rate was lower than the 10 year risk-free rate with an adjustment required of 0.04%.¹⁰⁸⁶ This continues to suggest that Ibbotson and Siegel-type estimates of the TAMRP for New Zealand would be very similar assuming a five year or 10 year term for the risk-free rate.
- H7.78 The difference between the average five-year and 10 year risk-free rate approximated using US government bonds covering the period 1962 – 2010 is 0.25% (6.62% and 6.87% respectively). This results in the five-year risk-free rate being lower than the 10 year risk-free rate by 0.25%. PwC estimated this adjustment to be 0.08%.¹⁰⁸⁷ This suggests that Ibbotson and Siegel-type estimates of the TAMRP for the US would be higher.
- H7.79 Table H12 below indicates that from the New Zealand evidence, the mean TAMRP (rounded to the nearest 0.5%) is 7.0%, and if all the eleven estimates are used (i.e. the TAMRP from New Zealand, the US and other), the mean is 7.0%.

¹⁰⁸⁵ The analysis has included survey data from the US, submitted by PwC (Electricity Networks Association, *Cost of Capital Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, Attachment: PricewaterhouseCoopers, *Report: prepared for Electricity Networks Association*, 3 September 2010, pp. 10-13) and corrected as per the advice from Dr Lally (Lally, M., *Comments on Input Methodologies (EDS) Draft Reasons Paper*, 3 September 2010). PwC submitted that the survey result from Graham and Harvey was based on a geometric average therefore the MRP estimate has been adjusted to reflect a result based on an arithmetic average.

¹⁰⁸⁶ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, pp. 41-42; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, pp. 40-41.

¹⁰⁸⁷ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, pp. 41-42.

Table H12 Estimates of the TAMRP - Assuming a 5-year term (where possible) of the risk-free rate for 2010

Methodology	NZ	US	Other	All
Ibbotson1088 *	7.27%	7.67%	7.50%	
Siegel *	6.40%	7.30%	6.60%	
Cornell	5.20%	6.80%		
Survey	8.20%	6.90%		
Median	6.84%	7.10%	7.05%	7.09%
Mean	6.77%	7.17%	7.05%	6.98%
* The Ibbotson estimate for “Other” and Siegel estimates in this table are for a 10-year risk-free rate term not a 5-year term. It is not possible to adjust the Ibbotson estimate for “Other” due to the lack of a suitable proxy. It is not possible to adjust the results from the Siegel method due to the lack of a term structure for inflation-proof bonds.				

H7.80 As a reasonableness check on the results from Table H12, the Commission evaluated the change to the mean TAMRP by adjusting the Ibbotson result for the difference between the five-year and 10 years risk-free rates as estimated by PwC (for ENA) and PwC (for Telecom). This resulted in an average TAMRP of 6.98%.¹⁰⁸⁹

Overseas regulators current estimates of the MRP

H7.81 The table below shows MRP estimates adopted by overseas regulators. The MRP used by overseas regulators is not directly comparable to the TAMRP used in the New Zealand context. MRP is used in the classical CAPM whereas the simplified Brennan-Lally CAPM requires the tax adjusted version of MRP, i.e. the TAMRP. The table below therefore also shows the conversion of the overseas MRP estimates to their corresponding TAMRP equivalents.

¹⁰⁸⁸ Estimated using data from Dimson, E., P. Marsh and M. Staunton, 2010, Global Investment Returns Yearbook 2010, Credit Suisse and London Business School. Dimson, Marsh and Staunton estimated the MRP for New Zealand. The MRP is related to the TAMRP by using the formula $MRP = TAMRP - R_f(T)$, where R_f is the risk free rate of return and T is the investor tax rate (30%). Where the MRP is the Dimson et al estimate for the US MRP of 6.0% the adjustment to this estimate to reflect a five-year MRP is 0.24%, using the Commission’s estimate. The average five-year risk-free rate for July 2010 (from Bloomberg) is 4.76% and the associated tax rate is 30%.

Conversion of US Ibbotson estimate to five-years

Raw US MRP	6.0%
Adjustment for difference between US five-years and 10 year risk-free rate	0.24%
NZ Investor Tax Rate	30%
NZ five-year risk-free rate	4.76%
TAMRP	7.67%

¹⁰⁸⁹ The Ibbotson equivalent TAMRP estimate for the US is derived using the MRP from Dimson et al estimate for the US MRP of 6.0% the PwC adjustment to this estimate to reflect a five-year MRP is 0.08%. The average five-year risk-free rate for July 2010 (from Bloomberg) is 4.76% and the associated tax rate is 30%.

Table H13 MRP (and TAMRP equivalent) for Regulators in the UK and Australia

Regulator	MRP	TAMRP equivalent
Ofgem	4-5%	5.8-6.8%
Competition Commission/CAA	2.5-4.5%: Heathrow/Gatwick Airport 3-5%: Stansted Airport	4.3-6.8% (Full range)
Ofcom	4-5%, 5% used	6.8%
Ofwat	5.4%	7.2%
Australian Energy Regulator (AER)	6.5%	6.9%
ACCC (Rail) and QCA	6%	6.4%
IPART (NSW)	5.5-6.5% (Preliminary view)	5.9-6.9%

H7.82 The table above illustrates that a TAMRP estimate of 7%, as adopted in previous decisions by the Commerce Commission, is higher than those adopted by most overseas regulators.

Conclusion - the long-term TAMRP estimate

H7.83 The Commission considers that Dr Lally’s estimate of 7% for the expected TAMRP derived in the context of the Gas Authorisation in 2008 was robust. This estimate is consistent with the range of TAMRP estimates used by New Zealand market participants. This estimate is higher than those adopted by most overseas regulators. The Expert Panel also considered that a TAMRP estimate of 7% was reasonable in the New Zealand context.

H7.84 In deriving and updating the 2008 estimate the Commission considers there is no evidence to support changing the TAMRP estimate of 7%.

H7.85 For these reasons, the IM specifies a TAMRP relative to five-year risk-free rate of 7%. However, the Commission does acknowledge the possibility of the recent GFC having, at least temporarily, increased the TAMRP. This issue is discussed in detail below.

Commission’s reasons - the TAMRP estimate and the recent GFC

Views of submitters – Impact of the GFC

H7.86 In submissions, parties argued for an increase in the TAMRP due to the GFC. A number of submitters on the RDG and IM Discussion Paper contended that due to the GFC the TAMRP proposed by the Commission was too low, and it should be in the range of 7.5% to 8%.¹⁰⁹⁰ As support for this increase, submitters referenced the

¹⁰⁹⁰ NZ Airports, *Submission by NZ Airports Association on the Commerce Commission Input Methodologies Discussion Paper*, 31 July 2009, p. 80; Auckland Airport, *Submission to the Commerce Commission on Input Methodologies Discussion Paper*, 7 August 2009, p. 75; Wellington International Airport Limited, *Submission to the Commerce Commission on Input Methodologies*, 7 August 2009, p. 59; Christchurch International Airport Limited, *Submission on Commerce Commission Input Methodologies Discussion Paper*, 7 August 2009, p. 27; LECG, *Comments on the*

AER's increase in the MRP estimate from 6% to 6.5% as a consequence of the GFC.¹⁰⁹¹

- H7.87 At the Cost of Capital Workshop there was general agreement between the experts that, both from a theoretical and a practical point of view, the TAMRP had probably risen due to the GFC, and there was a reasonable consensus that over time it would revert to its long-term historical average. There was no consensus on how long the period of time to revert to historical averages would be. However, several parties indicated that the Commission should not be too premature and assume that markets have returned to their long-term historical averages too quickly.¹⁰⁹²
- H7.88 However, when asked at the Cost of Capital Workshop if the practitioners had changed their estimate of the TAMRP due to the GFC, only KPMG indicated that it had made an explicit adjustment (of 0.25%) to the underlying rate that it had previously used when advising clients.
- H7.89 Table H14 summarises what advisors indicated at the Cost of Capital Workshop was their current advice on the TAMRP to clients and whether the advice included an adjustment to reflect the GFC.

Commerce Commission's proposed approach to estimating the cost of capital, Report prepared for the NZAA, 31 July 2009, pp. 26-27; Unison Networks Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: Castalia Strategic Advisors, *Submission on Input Methodologies: Regulatory Cost of Capital: a report prepared for Unison Limited, 13 August 2009*, pp. 8-9; Electricity Networks Association, Comments on the Commerce Commission's proposed approach to estimating the cost of capital, 11 August 2009, pp. 17-18; Maui Development Limited, *Submission on the Input Methodologies Discussion Paper*, July 2009, p. 19; Powerco Limited, *Input Methodologies Discussion Paper*, 14 August 2009, pp. 29-30; PricewaterhouseCooper, *Revised Draft Guidelines - Submission to Commerce Commission, Report on behalf of Powerco*, August 2009, pp. 14-17; PricewaterhouseCooper, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, pp. 9-10; Vector Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: Synergies Economic Consulting, *Initial Weighted Average Cost of Capital Review: prepared for Vector Limited*, 13 August 2009, pp. 35-43; Telecom, *Annex B: Submission on Commerce Commission Revised Draft Guidelines for estimating the Cost of Capital*, August 2009, Annex B; Transpower, *Submission to the Commerce Commission on: Transpower Process and Recommendation Discussion paper Input Methodologies Discussion Paper*, August 2009, pp. 25-27; Unison, *Appendix: Submission on Revised Draft Guidelines: The Commerce Commission's Approach to Estimating the Cost of Capital*, 14 August 2009, p. 7; Vector, *Submission to Commerce Commission on Input Methodologies Discussion Paper*, 14 August 2009, p. 91; Wellington Electricity, *Submission to the Commerce Commission on its Input methodologies Discussion Paper*, 14 August 2009, p. 27.

¹⁰⁹¹ Using a risk-free rate of 6% (based on the 10 year New Zealand government bond rate averaged over January 2010) and an investor tax rate of 30%, these values convert to a TAMRP of 6.4% and 6.9%. For the conversion process of the Australian based MRP estimates see Lally, M., *International Comparison of Regulatory Cost of Capital for Gas Distribution Businesses*, Report to the New Zealand Commerce Commission, 28 October 2008, p. 12.

¹⁰⁹² Commerce Commission, *Cost of Capital Workshop Transcript*, pp. 88-96.

Table H14 Summary of Advisors Current TAMRP Advice to Client

Organisation	TAMRP Recommendation	Was TAMRP adjusted due to the GFC?
KPMG	7.75%	Yes (from 7.5%)
Ireland, Wallace and Associates (Mr Ireland)	7.5%	No
Uniservices (Dr. Marsden)	7.5%	No
LECG (Prof Van Zijl)	7.5%	No
PwC NZ (Mr Redmayne)	7.5%	No
PwC Aus (Mr Balchin)	7.5%	No change in Australia
NZIER (Dr Layton)	7%	No
Synergies Economic Consultancy (Professor Bowman)	9%	No consideration given to the issue

H7.90 In post-workshop submissions, suppliers suggested that due to the GFC there was persuasive evidence for a higher TAMRP.¹⁰⁹³ These recommendations are displayed in Table H15.

Table H15 Recommendations to the Commission on the TAMRP due to the GFC

Organisation	TAMRP Recommendation
AECT	9% (the Commission should increase the TAMRP to 7.5%, then add an increase above this for the GFC)
MDL	7.75%
Synergies Economic Consulting (for Vector)	9%
Unison	8.2%
Vector	9% (at least 1.5% increase above 7.5%)

H7.91 The Commission notes that many submitters have continued to urge the Commission to maintain the 0.5% uplift in the TAMRP for the GFC but only KPMG has actually altered its TAMRP estimate because of the GFC.¹⁰⁹⁴

¹⁰⁹³ Auckland Energy Consumer Trust, *Cross Submission to the Commerce Commission on Cost of Capital Workshop*, 2 December 2009, p. 26; Maui Development Limited, *Cost of Capital Workshop 12th-13th November 2009 – Cross-Submission by Maui Development Limited*, 2 December 2009, p. 22; Vector, *Cross Submission to the Commerce Commission on the Weighted Average Cost of Capital Workshop*, 2 December 2009, p. 4 and pp. 11-12; Synergies Economic Consulting for Vector, *Cost of Capital Cross Submission*, 2 December 2009, pp. 15-16; Unison, *Post Workshop Submission: Weighted Average Cost of Capital*, 2 December 2009, p. 12.

¹⁰⁹⁴ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, p. 46; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13

- H7.92 In a submission on the Transpower Draft Reasons Paper, Officer and Bishop (for Transpower) using evidence on Australian and New Zealand stock market return volatility and implied MRP from Australian forward markets contracts considered that the TAMRP should be increased by 2%.¹⁰⁹⁵
- H7.93 The Commission considers that Officer and Bishop's measure provides some evidence that the prevailing short-term Australian MRP may be above its long-term historical level. However, it does not follow that the New Zealand TAMRP over the full five-year regulatory period is above its long-term historical level. Officer and Bishop also submitted their approach to the AER which did not accept the approach.¹⁰⁹⁶

Expert Panel's view - Impact of the GFC

- H7.94 Consultation with the Expert Panel on the TAMRP was completed prior to the full impact of the GFC being realised and this was highlighted in a statement by Dr Lally at the Cost of Capital workshop.¹⁰⁹⁷
- H7.95 Given the significance of the matter, following the Cost of Capital workshop the Commission requested the Expert Panel to review the 7% estimate of the TAMRP outlined in the RDG and IM Discussion Paper in light of the GFC.
- H7.96 The Expert Panel prepared a report for the Commission addressing this issue.¹⁰⁹⁸ In its report, the Expert Panel assessed whether an increase in the previously recommended estimate of the TAMRP of 7% was required, and carefully examined the issue of the backward-looking versus forward-looking estimation technique in light of the GFC.

August 2010, p. 45; Electricity Networks Association, Cost of Capital Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, 3 September 2010, p. 2; KPMG, Cross-Submission on GPBs (Input Methodology) Draft Reasons Paper, Cost of Capital, 13 August 2010, pp.15-17; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, 13 August 2010, pp. 15-16; Wellington Electricity Lines Limited, Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, 13 August 2010, p. 11; Vector Ltd., Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital, 13 August 2010, p. 27; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp.24-30; Marlborough Lines, Submission on EDBs (Input Methodology) Draft Determination and Reasons Paper, Draft Reasons Paper and Associated Draft Determination - Cost of Capital, 13 August 2010, p. 4; Transpower New Zealand Ltd., Submission on Transpower (Input Methodologies) Draft Reasons Paper, Cost of Capital Decisions, August 2010, p. 11; Transpower New Zealand Ltd., Submission on Transpower (Input Methodologies) Draft Reasons Paper and Individual Price-Quality Path, Attachment: R. R. Officer & S. Bishop - Independent Review of Commerce Commission's WACC Proposals for Transpower, 5 August 2010, pp. 14-22.

¹⁰⁹⁵ Officer and Bishop based the New Zealand MRP on Australian data as they considered the Australian market to be comparable. See Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Officer R. and Bishop S., *Independent Review of Commerce Commission WACC proposals for Transpower*, 5 August 2010, pp. 14-22.

¹⁰⁹⁶ AER, *Final decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009, pp. 233-234.

¹⁰⁹⁷ Commerce Commission, *Cost of Capital Workshop Transcript*, p. 95.

¹⁰⁹⁸ Franks, J., Lally, M., Myers, S., *Recommendation to the New Zealand Commerce Commission on whether or not it should change its previous estimate of the tax-adjusted market risk premium as a result of the recent global financial crisis*, 14 April 2010.

- H7.97 The Expert Panel agreed that historical (backwards-looking) estimation techniques do not pick up short-term shocks very quickly, and to the extent that they do recognise them, they will initially, i.e. until a longer term of data affected by the GFC is available, (wrongly) result in lower estimates of the market risk premium as a result of the GFC.¹⁰⁹⁹ They also agreed that forward-looking models are problematic to apply.
- H7.98 The Expert Panel agreed that, as a result of the recent GFC, the market risk premium and therefore the TAMRP was likely to have increased at least temporarily, due to increased levels of financial market volatility and investors' perception of the world as a much riskier place. However, the Expert Panel was unsure as to how long these increased levels of the market risk premium would persist.
- H7.99 Professor Franks noted that, after a period of rapid revaluation of asset prices in late 1987 (also referred to as 'Black Monday'), financial market volatility decreased rapidly, within around 13 weeks, after the event. However, in more recent years, he considered that financial market volatility has tended to persist over longer periods of time.
- H7.100 Professor Myers commented that since the height of the recent GFC approximately one year previous (at the time of his advice), financial market volatility has decreased markedly and asset prices had recovered. However, Professor Myers considered that investors still faced substantial macro economic uncertainties. Professor Myers considered that the MRP remained above its long-term historical average.
- H7.101 Professor Myers recommended that the Commission set a range for the MRP. He considered that the bottom of the range for the MRP should be 5%, and the top of the range should be a long-term historical arithmetic average MRP over long-term government returns, (which Dr Lally later estimated represented a MRP of 5.7%)¹¹⁰⁰. The Commission should then use the top of the range for the TAMRP until the world economy returns to normalcy and stable growth. Based on Lally's estimate of the upper bound, the recommendation of Professor Myers yielded a proposed MRP of between 5% and 5.7%, which implied a range for the TAMRP of 6.8% to 7.5%.
- H7.102 Professor Franks recommended that the Commission consider an increase of 0.5% to 1% to the TAMRP estimate, but suggested it should take the form of a temporary surcharge. Professor Franks did not provide a timeframe for the temporary increase.
- H7.103 In responding to Professor Franks' recommendation to increase the TAMRP temporarily, Dr Lally indicated that updating the TAMRP estimate to reflect temporary changes in market volatility would require a robust estimation technique to determine both the magnitude of the change to the TAMRP and the speed of reversion back to the earlier level. Dr Lally mentioned that quantitative models (for

¹⁰⁹⁹ The historical methods rely on the assumption that the outturns observed regarding achieved returns will be a reliable indication of investors' expected (required) returns only when periods of above expected performance are cancelled out by periods of below expected performance.

¹¹⁰⁰ Franks, J., Lally, M., Myers, S., *Recommendation to the New Zealand Commerce Commission on whether or not it should change its previous estimate of the tax-adjusted market risk premium as a result of the recent global financial crisis*, 14 April 2010, p. 6.

example as proposed by Merton)¹¹⁰¹ could potentially be used for this purpose. However, there would be serious questions around the reliability of any such model and its parameter values.

H7.104 The alternative was to use judgement, but Dr Lally was wary about doing so because of the inevitable lack of transparency in such a process. Dr Lally also thought that desisting from making such temporary adjustments to the TAMRP, in view of the problems noted here, would not necessarily prevent regulated suppliers from earning their cost of capital over the life of their investments. This is because periods in which the TAMRP estimate was temporarily understated (through not temporarily raising the estimate) would tend to be offset by periods in which the TAMRP was temporarily overstated (through not temporarily lowering the estimate). On this basis, Dr Lally did not favour a change in the TAMRP estimate as a result of the GFC.

Overseas regulators and the GFC

H7.105 In the UK and Australia, regulators have had to consider the impact that the GFC will have on the cost of capital. In each of these decisions some consideration has been given as to whether or not the MRP should be adjusted in light of the effect of the GFC. A table summarising the MRP outcomes in recent decisions taking into account the GFC is provided below.

Table H16 MRP for Regulators in the UK and Australia

Regulator	MRP: Previous Views (Pre GFC)	MRP: Recent Views (Post GFC)	TAMRP equivalent (Post GFC)
Ofgem ¹¹⁰²	4-5%	No range quoted, but figure appears the same	5.8-6.8%
Competition Commission/CAA	2.5-4.5% Heathrow/Gatwick Airport ¹¹⁰³	3-5% Stansted Airport ¹¹⁰⁴	4.8-6.8%
Ofcom ¹¹⁰⁵	4-5%, 4.5% used	4-5%, 5% used	6.8%
Ofwat ¹¹⁰⁶	4-5%	5.4%	7.2%
AER ¹¹⁰⁷	6%	6.5%	6.9%
ACCC (Rail) and	6%	6%	6.4%

¹¹⁰¹ This refers to: Merton, R., On Estimating the Expected return on the Market. An Exploratory Investigation, *Journal of Financial Economics*, Vol. 8, 1980, pp. 323-361.

¹¹⁰² Ofgem, *Electricity Price Control Review Final Proposal*, 7 December 2009, pp. 52-53.

¹¹⁰³ BAA Ltd, *A report on the economic regulation of the London airport companies (Heathrow Airport Ltd and Gatwick Airport Ltd)*, 28 September 2007, Appendix F, p. F29.

¹¹⁰⁴ CAA, *Airport Regulation Economic Regulation of Stansted Airport 2009-2014 – CAA Decision*, March 2009, p. 62; Competition Commission, *Review of Stansted Airport Q5 price control*, October 2008, Appendix L, p. L24.

¹¹⁰⁵ Ofcom, *Ofcom's approach to risk in the assessment of the cost of capital*, August 2005, p. 36; Ofcom, *A New Pricing Framework for Openreach – Annexes*, 22 May 2009, pp. 161-162.

¹¹⁰⁶ Ofwat, *Future Water and Sewerage Charges 2010-2015 – Final Determination*, April 2009, pp. 128-129.

¹¹⁰⁷ AER, *Final decision: Electricity transmission and distribution network service providers – Review of the weighted average coat of capital (WACC) parameters*, May 2009, pp. 46-47.

Regulator	MRP: Previous Views (Pre GFC)	MRP: Recent Views (Post GFC)	TAMRP equivalent (Post GFC)
QCA ¹¹⁰⁸			
IPART (NSW) 1109	5.5-6.5%	6% (Preliminary view)	5.9-6.9%

H7.106 The regulators in Australia and the UK appear to have outlined different justifications for the approaches they have taken to account for the GFC. For example:

- Ofgem (December 2009) noted that there had been a strong recovery in equity prices since the low point of April 2009 and that many commentators and the Bank of England had indicated that the cost of equity had returned to normal levels in recent months. On that basis Ofgem maintained that there was no reason to believe that there had been a fundamental departure from the long-term trend in the MRP generally estimated to be between 3-5%;¹¹¹⁰
- Ofcom (May 2009), reviewed evidence from market commentators and the Bank of England. It suggested that the prolonged downturn in equity markets and higher levels of volatility suggested the MRP had increased in recent years. It maintained that setting an MRP too low (which could lead to discretionary investment being discouraged) was worse than the downside of setting an MRP too high, and therefore favoured setting an MRP at the upper end of the 4-5% range. It subsequently chose a point estimate of 5% as a response to the increased market volatility and turbulence. This was above its 2005 point estimate of 4.5%;¹¹¹¹
- Ofwat (April 2009) used a figure of 5.4%, which was at the high end of the Dimson, Marsh and Staunton series data for the long-term MRP and above its previous range of 4-5%. It outlined that this reflected its view that it should assume a high equity risk premium given the economic conditions within which the cost of capital was set. It acknowledged, however, that recent analysis suggested that the future long-run risk premium would be less than the historical average which had been used;¹¹¹²

¹¹⁰⁸ ACCC, *Australian Rail Track Corporation Limited – Hunter Valley Coal Network Access Undertaking – Draft Decision*, 5 March 2010, pp. 565-570; QCA, *Draft Decision – QR Network 2009 Draft Access Undertaking*, December 2009, pp. 13-15.

¹¹⁰⁹ IPART, *IPART's Cost of Capital after the AER's WACC Review – Lessons from the GFC*, November 2009, p. 39-40; IPART, *Final Decision: New South Wales Rail Access Undertaking – Review of rate of return and remaining mine life from 1 July 2009*, August 2009, p. 7.

¹¹¹⁰ Ofgem, *Electricity Price Control Review Final Proposal*, 7 December 2009, pp. 52-53.

¹¹¹¹ Ofcom, *A New Pricing Framework for Openreach – Annexes*, 22 May 2009, pp. 161-162.

¹¹¹² Ofwat, *Future Water and Sewerage Charges 2010-2015 – Final Determination*, April 2009, pp. 128-129.

- The AER (May 2009) increased its MRP figure from 6% to 6.5% on the basis that relatively stable market conditions did not presently exist, and there was uncertainty surrounding the GFC;¹¹¹³
- AER (October 2010) noted that they maintain the view that the long run historic MRP is 6%, and that this should be adopted as market conditions return to those seen pre GFC. The AER considered that a MRP of 6.5% may be considered conservative when accounting for improved financial conditions since the onset of the GFC, however, recovery in the global economy and conditions in global capital markets remained fragile.¹¹¹⁴
- ACCC (March 2010) notes that it and AER increased their MRP estimate to 6.5% in late April 2009 based upon capital market and global economic conditions at the time. However, the ACCC considered that economic and capital market conditions had significantly improved since that time and the arguments that the MRP used by investors' remains above 6% are extremely weak. An important feature of the decision was that the ACCC drew a distinction between its position and the previous AER WACC position of having an MRP of 6.5%.¹¹¹⁵
- IPART (August 2009) applied an MRP estimate of 6% in its determination of the rate of return applicable to the Hunter Valley Coal Network in 2009;¹¹¹⁶
- IPART (November 2009) outlined that even though current market conditions indicated that the MRP may be higher than the MRP based on a long-term time series, this did not necessarily suggest that this would be the case in the near future. In particular, it noted that given the medium term pricing decision made by the regulator, it needed to ensure that the MRP was representative of the MRP during the regulatory period. IPART's preliminary view was that the MRP range should not be changed. It noted that as financial markets were quite volatile in the short-term, reliance on forward-looking estimates could lead to significant variance in MRP estimates between cost of capital decisions and would not provide for regulatory certainty;¹¹¹⁷
- Queensland Competition Authority (QCA) (December 2009) in its draft decision for Queensland Rail Network also applied an MRP of 6%. The QCA did not propose to adopt the AER's change in MRP estimate because it considered that 6% was a reasonable estimate. It argued that any adjustment made for short-term fluctuations in market conditions was inherently subjective, in terms of both the scale of the adjustment that was required and the period of the adjustment over which the adjustment was made. The QCA

¹¹¹³ AER, *Final decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009, pp. 46-47.

¹¹¹⁴ AER, *Final decision Victorian electricity distribution network service providers Distribution determination 2011-2015*, October 2010, pp. 484 & 489

¹¹¹⁵ ACCC, *Australian Rail Track Corporation Limited – Hunter Valley Coal Network Access Undertaking – Draft Decision*, 5 March 2010, pp. 565-570.

¹¹¹⁶ IPART, *Final Decision: New South Wales Rail Access Undertaking – Review of rate of return and remaining mine life from 1 July 2009*, August 2009, p. 7.

¹¹¹⁷ IPART, *IPART's Cost of Capital after the AER's WACC Review – Lessons from the GFC*, November 2009, pp. 39-40.

also highlighted that if it were to increase the MRP now it would be inconsistent as the QCA had not lowered the MRP estimate in previous decisions when less volatile market conditions were evident and some stakeholders had sought reductions in the MRP.¹¹¹⁸

H7.107 Table H16 shows that some regulators increased their MRP estimates as a result of the GFC. However, the Commission notes that when calculating the equivalent TAMRP corresponding to the post GFC MRPs set by overseas regulators, in all but one instance these estimates would still have been below the 7% estimate suggested by the Commission as being appropriate in the RDG and the IM Discussion Paper. Further, in the more recent decisions or draft decisions by these regulators, (i.e. the decisions made by Ofgem, IPART, QCA and the ACCC since August 2009), the MRP has not been adjusted upwards to account for the GFC.

H7.108 Despite the increase in the estimated MRP to take into account the GFC by regulators, it appears that the overall cost of capital in a number of the examples outlined above, has either remained unchanged or decreased between regulatory decision points. This has been due to reductions in other parameters, such as the estimated risk-free rate, and in the case of the AER, the estimated equity beta.

H7.109 Finally, the Commission notes that the matters leading Ofcom to adopt the upper bound of the MRP range, have typically been considered by the Commission when assessing what percentile it should use for the overall cost of capital, rather than for assessing the TAMRP in isolation.

Options for the Commission in dealing with the TAMRP for the GFC

H7.110 In light of submissions, the Expert Panel advice and the approach taken by other regulators in response to the GFC, the Commission considers that there are two options open to it:

- keep the TAMRP at 7.0%, which was the recommendation of Dr. Lally;
- raise the TAMRP temporarily to (i.e. for a fixed duration), as was suggested by both Professors Myers and Franks.

H7.111 The Commission considers that a temporary adjustment to 7.5% is appropriate.

H7.112 The Commission considers that despite the GFC there are strong arguments for maintaining a long-term TAMRP estimate at 7% (evidence in Table H14 post GFC). That is, while other regulators may have increased the MRP in response to the GFC, the higher MRP they have set corresponds to a TAMRP measure that is generally below the 7%. Further, the more recent regulatory decisions have not increased the MRP to take into account the GFC. Ofgem noted in its December 2009 decision that many commentators and the Bank of England had indicated that the cost of equity had returned to normal levels in recent months after the share market lows of April 2009.

H7.113 The Commission considers, however, that there are good arguments for temporarily increasing the TAMRP to 7.5% in response to the GFC. Whilst there was no

¹¹¹⁸ QCA, *Draft Decision – QR Network 2009 Draft Access Undertaking*, December 2009, pp. 13-15.

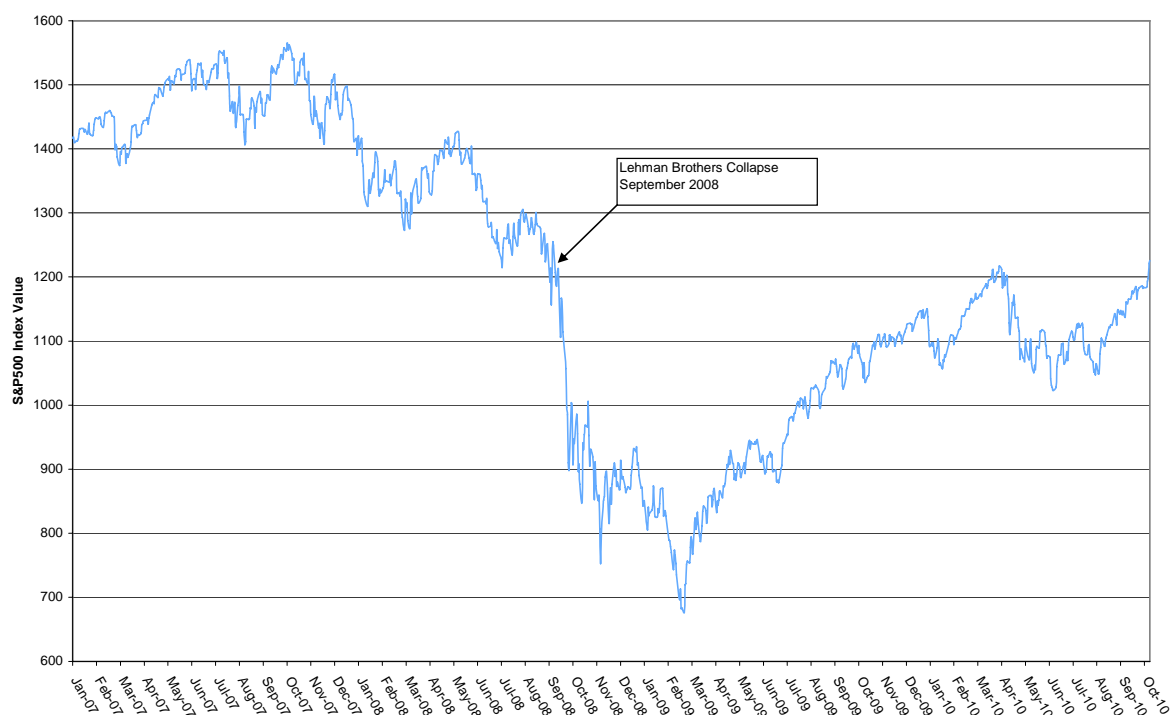
unanimous agreement by the Expert Panel on how to deal with the GFC, there was agreement that the TAMRP was likely to have increased, at least temporarily, due to the increased levels of financial market volatility and investors' perception of the world as much riskier for investors.

H7.114 The Commission also recognises that crises eventually pass but the timing of the return to normalcy is uncertain. The Commission is conscious that when estimating the TAMRP for a regulatory period, the Commission needs to reflect its best estimate of the average conditions over the complete disclosure/regulatory period.

H7.115 Taking into account the original shock and the subsequent partial recovery of the markets, in the context of the regulatory period over which the Commission's decision will apply, the Commission is of the view that it is appropriate to temporarily increase the TAMRP before reverting to its long-term TAMRP estimate of 7%. Specifying in advance the quantum and period of the temporary increase provides regulatory certainty.

H7.116 In assessing the appropriate time period for the adjustment in the TAMRP, the Commission has examined the behaviour of the S&P 500 equity index of US stocks from a point in time prior to the significant events that occurred in the debt capital and equity capital markets until the time of making final decisions (i.e. January 2007 until October 2010). The behaviour of the S&P 500 equity index during this period is shown in the Figure H7 below.

Figure H7 Value of the S & P 500 January 2007 to October 2010



Source: Yahoo Finance <http://finance.yahoo.com/>

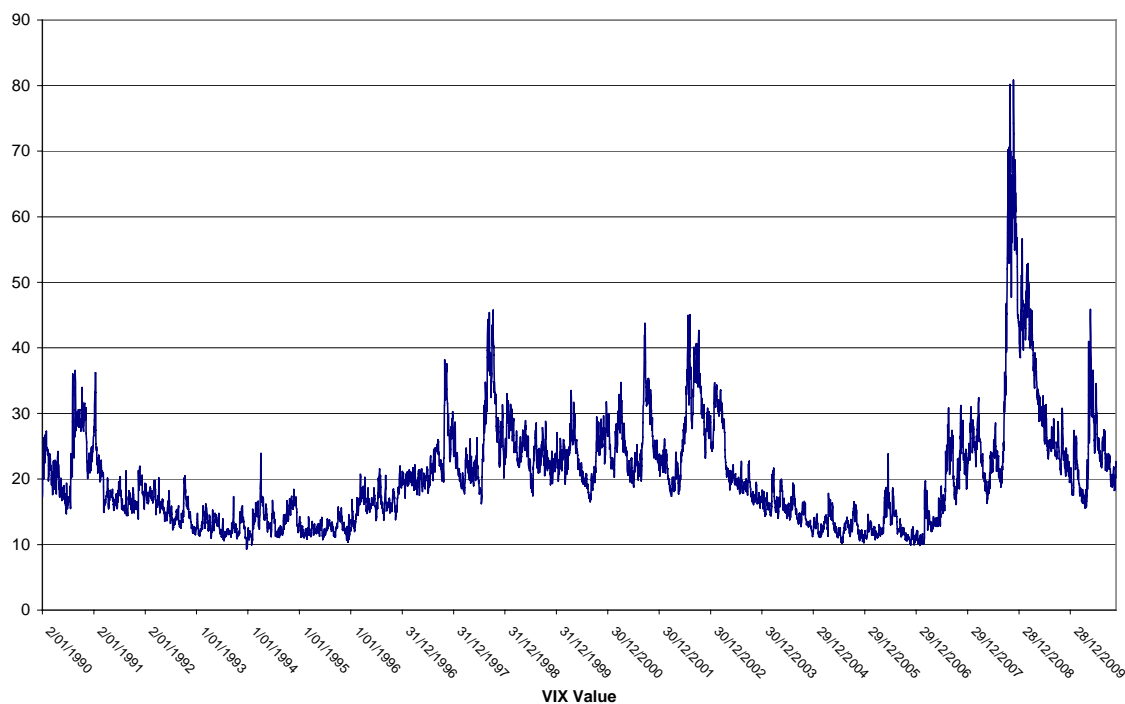
H7.117 Whilst the events in the debt capital markets commencing in July 2007 and the events surrounding Bear Stern in March 2008 had some (relatively short lived) effect

on the equity capital markets, it is the events surrounding Lehman Brothers in September 2008 (leading to Lehman Brothers filing for bankruptcy on 15 September 2008) which triggered the massive fall in the equity capital markets.

H7.118 From the low point reached in March 2009, the S&P 500 equity index has since recovered almost to the level now that it was at immediately prior to Lehman Brothers filing for bankruptcy. In light of the above events, the Commission considers the GFC effect on the equity markets essentially began on the date when Lehman Brothers filed for bankruptcy. The Commission also notes that the market has recovered quickly from other subsequent shocks such as the default by Greece, with no apparent lasting effect.

H7.119 The Commission also notes that from its high point reached in late 2008, the volatility implied by the VIX has quickly reverted to its long-term trading range, as displayed in Figure H8.¹¹¹⁹

Figure H8 Volatility of the S&P500 index (VIX)



Source: Yahoo Finance <http://finance.yahoo.com/>

H7.120 The Commission considers that, although the equity index has substantially recovered and volatility has reverted to its long-term trading range, it is prudent to be cautious in assessing whether the effects of the GFC, in so far as they might affect the TAMRP, are now behind us. Therefore, consistent with the Commission erring on the side of caution, the Commission considers that it is prudent to maintain the adjustment in the TAMRP until June 2011. This cannot be interpreted to imply that the Commission is stating that the effects of the GFC will be over at a particular

¹¹¹⁹ VIX is the ticker symbol for the Chicago Board Options Exchange's Volatility Index. The VIX is a key measure of market expectations of near-term volatility conveyed by S&P 500 stock index option prices. Higher levels of the VIX indicate greater expected market volatility, while lower VIX levels indicate a more benign outlook.

point in time. The Commission accepts that the effects of the GFC in terms of slow economic growth will likely last beyond June 2011, but with respect to the TAMRP the relevant issue is the GFC's effect on the size of the premium investors seek for holding risky assets. On this, the Commission considers there is good evidence that the increase in the TAMRP from the GFC was temporary and is reverting to its long-term level (that is, around 7%). In particular, the Commission notes:

- the New Zealand share market and global share markets have stabilised and are at levels well above their GFC-induced lows;
- the VIX, a key short-term indicator of investor risk aversion, has fallen significantly and is back to around its long-term trend levels;
- some regulators who increased their MRP estimates after the GFC have ceased adding the increase to their long-run estimates of the MRP to allow for the GFC (especially ACCC);
- annual surveys of the level of MRP companies and analysts use in their CAPM models exhibit a decline since GFC,¹¹²⁰ and
- many New Zealand market participants did not increase their TAMRP estimates during or after the GFC (for example, only one of the advisors at the Cost of Capital Workshop had increased its TAMRP estimate). Some New Zealand market participants have subsequently reduced the temporary increase they made to their TAMRP estimates during the GFC (e.g. First NZ Capital).

Conclusion - the TAMRP estimate

H7.121 As stated above, the Commission's decision is that the long-term TAMRP should be set at 7%. However, due to the effect that the GFC has had on the equity markets, the Commission considers that it is appropriate for the TAMRP to be temporarily increased to 7.5%. This temporary increase will apply for the regulatory year-ends falling in the calendar years 2010 and 2011, before the TAMRP reverts to its long-term level of 7%.

H7.122 The TAMRP will be expressed as a composite rate over a five-year period. Further, the higher TAMRP will only apply if the regulatory period falls over the entire year when the uplift to account for the GFC applies. Therefore, for a cost of capital estimated for five years commencing on 1 April 2010, the TAMRP would be 7.1% (estimated by $(7.5 \times 1 + 7.0 \times (5 - 1)) \div 5$).

H7.123 Following this approach in the context of information disclosure in 2010 - 2011 the five-year TAMRP would be 7.1%, and in 2011-2012 would be 7%. For the cost of capital used for starting price adjustments for the period 2010-2015, the TAMRP will be 7.1%. For the three, four or five-year CPP applied after 30 June 2011 the TAMRP would be 7%.

¹¹²⁰ See for example Fernandez, P, and del Campo, J., Market Risk Premium used in 2010 by Analysts and Companies: a survey with 2,400 answers, 21 May 2010. In the survey reported in that paper three times as many respondents has reduced their MRP estimates in 2010 when compared to their estimates in 2009, than had increased their estimates (at pp. 3-4, and 6-7).

Decision - Standard Error of the TAMRP

H7.124 The standard error of the TAMRP is 1.5%.

Commission's reasons – approach to estimating the standard error of the TAMRP

Previous estimates of the standard error of the TAMRP used by the Commission

H7.125 To estimate the TAMRP and its standard deviation¹¹²¹ in the Gas Control Inquiry, Electricity Distribution – Control of Unison and the Gas Authorisation, Dr Lally reviewed *ex post* approaches,¹¹²² *ex ante* approaches,¹¹²³ and survey evidence from both New Zealand and foreign markets.¹¹²⁴

H7.126 Dr Lally, in Appendix 2 of the Gas Authorisation, demonstrates the process to estimate the standard deviation of the TAMRP estimate.¹¹²⁵ As with the TAMRP estimate, Dr Lally had concerns with the reliability of the standard deviation estimate from the Merton methodology and therefore did not use the Merton result in the estimation of the standard deviation of the TAMRP estimate. In addition, survey evidence is not amenable to estimation of a standard deviation. Therefore, the process places equal weight on the standard deviation estimates from the Ibbotson, Siegel and Cornell approaches based on New Zealand data, the Ibbotson, Siegel and Cornell estimates from the US data, and the Ibbotson and Siegel estimates of 16 other countries' estimated standard deviations of the estimated TAMRP.

H7.127 From this information Dr Lally estimated a standard deviation of 1.5% for the estimated TAMRP.¹¹²⁶ As this estimate is relatively recent and the methodology applied is essentially the same as that used by the Commission in the current context, the Commission does not consider that there are sufficient grounds to depart from this estimate of the standard deviation around the TAMRP.

H7.128 The Commission notes that the survey by Fernandez and del Campo noted earlier also provides the standard deviation of the MRP used by analysts and companies. For US analysts, the standard deviation of the MRP used was 1.1%. For US companies, the standard deviation of the MRP used was 1.8%.¹¹²⁷ This supports the reasonableness of the 1.5% estimate of the standard error specified in the IM.

¹¹²¹ The Commission notes that the estimates of the standard deviations referred to by Dr Lally are standard errors.

¹¹²² *Ex post* estimation techniques evaluated were Morningstar (Ibbotson) and Siegel types, the constant reward to risk methodology of Merton.

¹¹²³ *Ex ante* approaches were Cornell, and survey evidence.

¹¹²⁴ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, paper prepared for the Commerce Commission, 24 November 2004, pp. 10-26; Lally, M., *The weighted average cost of capital for electricity lines businesses*, September 2005, pp. 10-29; Lally, M., *The weighted average cost of capital for gas pipeline businesses*, 28 October 2008, pp. 16-38.

¹¹²⁵ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, 28 October 2008, Appendix 2, pp. 166-169.

¹¹²⁶ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, paper prepared for the Commerce Commission, 24 November 2004, p. 18; Lally, M., *The weighted average cost of capital for electricity lines businesses*, September 2005, pp. 20-21; Lally, M., *The weighted average cost of capital for gas pipeline businesses*, 28 October 2008, p. 27 and Appendix 2.

¹¹²⁷ Fernandez, P., and J. del Campo *Market Risk Premium used in 2010 by Analysts and Companies: a survey with 2,400 answers*, 21 May 2010. The standard errors for European and UK analyst estimates were 1.3% and 1.4% (p.2); and were 1.5% and 1.8% for European and UK company estimates (p.5).

Views of submitters – standard error of the TAMRP

H7.129 Professor Guthrie on behalf of Transpower submits that the standard deviation of the TAMRP of 1.5% estimated by Lally is subject to a number of errors or questionable assumptions, particularly with respect to assumptions regarding the correlation between the different estimators. Professor Guthrie also provides his own estimate of 3.1% for the standard deviation of the TAMRP.¹¹²⁸

H7.130 The Commission asked Dr Lally to review Professor Guthrie's submission. Dr Lally refutes Professor Guthrie's points and advises that the estimate of the standard deviation of the TAMRP of 1.5% does not require alteration.¹¹²⁹

Conclusion – standard error of the TAMRP

H7.131 The standard error of the TAMRP is 1.5%.

H8 Asset and Equity Betas

Decision - asset and equity betas

H8.1 The IM specifies an asset beta for EDBs of 0.34. Combining this estimate with a notional leverage of 44% equates to an equity beta for EDBs of 0.61.

H8.2 The IM specifies an asset beta for GPBs of 0.44. Combining this estimate with a notional leverage of 44% equates to an equity beta for GPBs of 0.79.

H8.3 In finalising the IM the Commission:

- uses comparable entity analysis as its primary approach to estimating the regulated service wide equity beta, and performs a sense check of the resulting equity beta estimate against other New Zealand market equity betas;
- converts equity beta estimates into asset beta estimates (and vice versa) using the tax-neutral formula. It applies the tax-neutral formula regardless of the tax regime that exists in the country from which the beta estimates are drawn;
- makes no adjustment for regulatory differences to EDBs or GPBs asset beta estimates;
- makes an adjustment of 0.1 to the GPBs' asset beta estimate to account for the difference in risk between EDBs and gas pipeline services in New Zealand;
- makes no adjustments of a Blume or Vasicek type;
- determines the standard error for EDBs' asset beta is 0.13; and
- determines the standard error for GPBs' asset beta is 0.14.

¹¹²⁸ Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Guthrie G., *Measurement Error and Regulated Firms' Allowed Rates of Return: a report prepared for Transpower New Zealand Limited*, 14 August 2010, pp. 15-17.

¹¹²⁹ Lally, M., *Comments on Measurement Error and Regulated Firms' Allowed Rates of Return*, 13 September 2010, pp. 2-11.

Reasons - asset and equity betas

- H8.4 The equity beta measures a security's sensitivity to market risk (i.e. beta is a measure of exposure to systematic risk). As neither asset nor equity betas are directly observable, they need to be estimated. For firms with traded stocks, the equity beta for the firm can be estimated directly from the historical returns on those stocks, relative to the market's return.
- H8.5 In many cases direct estimation may not be feasible because no traded returns are available. For example, the firm may be unlisted, or the Commission may be interested in estimating the beta of only a single division within a company with multiple lines of business.
- H8.6 Moreover, even when traded returns are available, firm-specific beta estimates are often statistically imprecise. To help overcome these problems, the Commission has estimated a regulated service wide equity beta using individual beta estimates of a portfolio of comparable businesses.
- H8.7 Due to the uncertainty associated with beta estimates the Commission estimates the standard error for the asset beta from the portfolio of comparable firms used to estimate the asset beta.

Equity betas – service-specific or supplier-specific

Experts' advice

- H8.8 In the Expert Panel report Professor Myers and Dr Lally recommended that service-specific¹¹³⁰ betas should be estimated, i.e. separate betas for airports, EDBs, GPBs and Transpower. Dr Lally was doubtful whether reliable adjustments could be made to service-specific betas to account for intra-service variations (i.e. variations across individual airports, or EDBs, or GPBs) in factors other than financial leverage.¹¹³¹

Decision

- H8.9 The Commission agrees that as the equity beta measures an asset's or a security's sensitivity to market risk and EDBs, GPBs and Transpower may face different levels of systematic risk, different equity betas could apply, in principle, to Transpower and different EDBs and GPBs.
- H8.10 However, estimating asset betas for an industry (or specific service) is inherently imprecise and involves a significant degree of judgement. Estimating individual supplier-specific equity betas would require an even greater degree of judgment than estimating service-specific equity betas.
- H8.11 Most of the EDBs and GPBs are not listed and there is no reliable information available to the Commission to enable it to estimate a supplier-specific asset/equity beta.¹¹³²

¹¹³⁰ The Expert Panel referred to a regulated service (service-specific) as an industry. Under Part 4 of the Act the Commission regulates services not industries. Therefore a service-specific asset beta refers to the average beta of that service.

¹¹³¹ Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology, Report prepared for the Commerce Commission*, 18 December 2008, pp. 24-26.

¹¹³² There are only two listed energy distribution service providers. Horizon Energy for electricity and Vector for electricity and gas.

H8.12 The cost of capital IM provides for a service specific cost of capital. Making supplier-specific estimates is not practical or necessary and would require even greater judgement than making service-specific estimates.

H8.13 Therefore, in the context of EDBs, GPBs and Transpower, the Commission considers a service specific asset/equity beta to be appropriate.

The Commission's approach to estimating equity betas

H8.14 The steps the Commission has followed in estimating equity betas can be summarised as follows:

- Step 1: identify a sample of relevant comparator firms. This includes:
 - New Zealand firms from the service in question;
 - New Zealand firms from industries with a similar risk profile;
 - overseas firms from the service in question; and
 - overseas firms from industries with a similar risk profile.
- Step 2: estimate the equity beta for each firm in the sample;
- Step 3: de-lever each equity beta estimate to get an estimated asset beta for each firm in the sample;
- Step 4: calculate an average asset beta for the sample;
- Step 5: apply any adjustments for regulatory differences or differences in systematic risk across services to the average asset beta for the sample;
- Step 6: re-lever the average asset beta for the sample to an equity beta estimate using the Commission's assumed notional leverage.

H8.15 In the EDBs and GPBs Draft Reasons Papers the Commission followed the six step process outlined above.¹¹³³ This resulted in 54 comparator companies identified (as shown in Table H17) and analysed over a single five-year period using monthly frequency data. This analysis estimated an asset beta of 0.34. An additional 0.10 increment was added to the asset beta for GPBs (becoming 0.44) to allow for greater risks associated with GPBs in New Zealand.

H8.16 Combining the estimate of the asset beta of 0.34 with the notional leverage of 40% proposed in the Draft Reasons Paper equated to an equity beta of 0.57 for EDBs and 0.73 for GPBs. The Draft Reasons Paper noted the Commission would undertake further analysis on beta in time for the Final Reasons Paper.

Standard error of the asset beta

H8.17 In the EDB and GPB Draft Reasons Papers the Commission estimated the standard error for the asset betas. These estimates used the Lally (2008) methodology and

¹¹³³ See Commerce Commission, *Input Methodologies Electricity Distribution Services, Draft Reasons Paper*, section 6.9, pp. 279-302; Commerce Commission, *Input Methodologies Gas Pipeline Services, Draft Reasons Paper*, section 6.9, pp. 260-291.

using the comparative companies sample the Commission estimated a standard error of 0.12 for EDBs asset beta and 0.14 for GPBs asset beta.

Submitters views on the Commission's approach

H8.18 The Commission received a number of submissions discussing the Commission's approach and results for the asset beta in the EDBs and GPBs Draft Reasons Papers. These are summarised below.

Submitters views on comparative sample selection (Step 1)

H8.19 Marlborough Lines and KPMG (for MDL) were concerned about the Commission's reliance on overseas comparator companies.

H8.20 Marlborough Lines considered that the sample the Commission had used potentially included businesses with different characteristics from those the Commission regulates in New Zealand. Marlborough Lines considered that the Commission should make a greater allowance in the estimation of the cost of capital to incorporate factors such as scale when applying empirically observed overseas evidence to New Zealand businesses.¹¹³⁴

H8.21 In estimating the asset beta for GPBs, KPMG (for MDL) suggested that the Commission should use a comparator company set based on a large number of GPBs. However, KPMG noted that there are very few listed GPBs in NZ, Australia and the US (even less that are solely gas transmission or gas distribution). Therefore, KPMG suggested the comparable company sample should be comprised of the asset beta estimates for GPBs applied by other regulators.¹¹³⁵

Submitters views on estimating the asset beta (Steps 2-4)

H8.22 A number of the submitters highlighted that when estimating betas a number of issues need to be considered: the choice of the market index; size of the comparable firms; thin trading; estimation period which may include market stress events or outliers (e.g. the dot com bubble and GFC); day of the week or month the data is sampled over and the estimation period.¹¹³⁶

H8.23 ENA provided a report from PwC that commented on the Commission's approach to estimating the asset beta. PwC (for ENA) analysed the Commission's comparator company beta data and considered there was evidence of thin trading.¹¹³⁷ PwC

¹¹³⁴ Marlborough Lines, *Submission on EDBs (Input Methodology) Draft Determination and Reasons Paper, Draft Reasons Paper and Associated Draft Determination - Cost of Capital*, 13 August 2010, p. 4.

¹¹³⁵ KPMG, *Cross-Submission on GPBs (Input Methodology) Draft Reasons Paper, Cost of Capital*, 13 August 2010, pp. 7-8.

¹¹³⁶ Commerce Commission *Cost of Capital Workshop Transcript*, pp. 185-203; Electricity Networks Association, *Submission on EDBs (Input Methodology) Draft Determination and Reasons Paper*, PricewaterhouseCoopers *Submission on the Cost of Capital Parameter Estimates*, 13 August 2010, pp. 47-54; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, pp. 46-52.

¹¹³⁷ Thin trading in a company's shares can lead to a downward biased ordinary least squares equity beta estimate. In evaluating thin trading on the Commission sample in the draft reasons paper, PwC found evidence that the a number of the US firms trade in small volumes and that Vector and the Australian companies there were occurrences of days when no share trading occurred. PwC considered that collectively these companies exhibit mild thin trading problems. PwC noted that this was a significant problem with the shares for Horizon Energy. See Electricity Networks Association, *Submission on EDBs (Input Methodology) Draft Determination and Reasons Paper*,

corrects for thin trading and selects different days of the month for analysis. This results in an average asset beta estimate, using monthly data of 0.37 (and 0.39 for the average asset beta using daily data).¹¹³⁸

- H8.24 Vector provided reports from CEG and Professor Grundy that covered the Commission's asset beta estimate. Vector and its advisers claim the Commission had underestimated the asset beta as it had not checked its results for sensitivities to the sampling period. This was because the Draft Reasons Paper had only evaluated monthly asset betas over a single five-year period. Vector considered that the asset beta for EDBs/GPBs should be closer to the asset beta of Airports and considered that for GPBs the underlying risks are comparable to Airports.¹¹³⁹ CEG performs sensitivity tests on the asset beta and concluded that from the sensitivity tests the best estimate of the asset beta is 0.40.
- H8.25 Transpower suggested the asset beta should be 0.40. It supports this with submissions from its experts, Officer and Bishop who use a debt beta of 0.2 to estimate an asset beta of 0.37, which they rounded to 0.40.^{1140,1141}
- H8.26 In consultation on the cost of capital some submissions recommended the Commission should adjust its asset beta estimate in light of the effect of the GFC.
- H8.27 PwC (for ENA) submitted that the sample period chosen by the Commission, in the draft reasons paper encompasses the GFC, which raises the possibility of producing unrepresentative beta estimates. In line with best practice of other regulators, PwC recommended that the Commission should exclude the period of the GFC when estimating the asset beta.^{1142,1143}

PricewaterhouseCoopers, *Submission on the Cost of Capital Parameter Estimates*, 13 August 2010, pp. 54-55, Appendix A.1 – A.2, pp. 59-62, and Appendix A.3 – A.6, pp. 1-12 (63-74).

¹¹³⁸ The Commission notes that PwC did not provide the results of the analysis before corrected for thin trading so the effect of correcting for thin trading on PwC analysis can not be evaluated to see if the results were different.

¹¹³⁹ Vector Ltd., *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, 13 August 2010, pp. 26-27; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 12-14; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Grundy B., *The Calculation of the Cost of Capital: a report prepared for Vector Limited*, 13 August 2010, pp. 11-12.

¹¹⁴⁰ Transpower New Zealand Ltd., *Submission on Transpower (Input Methodologies) Draft Reasons Paper and Individual Price-Quality Path*, Attachment: R. R. Officer & S. Bishop, *Independent Review of Commerce Commission's WACC Proposals for Transpower*, 5 August 2010, pp. 22-24 and 36-41.

¹¹⁴¹ Transpower New Zealand Ltd., *Submission on Transpower (Input Methodologies) Draft Reasons Paper, Cost of Capital Decisions, August 2010*, p. 11.

¹¹⁴² Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission's Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, pp. 54-55.

¹¹⁴³ The Commission notes, however, PwC advice is not consistent with other advice PwC has provided in other contexts. In its advice to Ofgem UK on the cost of capital for the UK electricity distribution businesses (December 2009), PwC UK did not propose to exclude the period of the GFC when estimating the asset beta (see PwC, *Advice on the cost of capital analysis for DPCR5, Final Report to the Office of Gas and Electricity Markets*, 28 July 2009). In its advice to the NZAA on the asset beta estimate for Airports as part of NZAA submission's on the Draft Airports Reasons Paper

- H8.28 By putting no weight on the GFC, PwC (for ENA) recommended that the Commission adopt an asset beta value of 0.46 for EDBs.¹¹⁴⁴
- H8.29 In contrast to PwC's submission, CEG (for Vector) and Vector submitted that the Commission should give greater weight to beta estimates during the GFC, as beta matters most to investors when risk is high.¹¹⁴⁵
- H8.30 Based on the analysis by CEG and by putting more weight on the estimates from the GFC, Vector recommended the asset beta for EDBs should be 0.44.¹¹⁴⁶

Submitters' views on making adjustments to the estimated the asset beta (Step 5)

- H8.31 KPMG (for MDL) considered that GTBs justify a higher asset beta compared to GDBs to reflect the higher risk that exists to the transmission business. KPMG (for MDL) recommended that the asset beta for GTBs should be 0.54 (compared to GDBs of 0.44) to reflect the differences between transmission and distribution.¹¹⁴⁷
- H8.32 In response to MDL, Vector, on advice from its expert Synergies Economic Consulting, were unconvinced that any adjustment to the asset beta should be made solely due to the difference between a revenue cap and a price cap.¹¹⁴⁸

Submitters views on the standard error of the asset beta

- H8.33 Several submitters suggested that the Commission's approach to estimating the standard error of the asset beta was unclear.¹¹⁴⁹
- H8.34 Professor Guthrie (for Transpower) demonstrated a procedure to estimate the standard error of the asset beta which resulted in an estimate of 0.11 to 0.12.¹¹⁵⁰

PwC did not exclude or propose to exclude the period of the GFC (see NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Analysis of Airport Betas: a report prepared for New Zealand Airports Association*, 3 August 2010).

¹¹⁴⁴ Electricity Networks Association, *Submission on EDBs (Input Methodology) Draft Determination and Reasons Paper*, PricewaterhouseCoopers *Submission on the Cost of Capital Parameter Estimates*, 13 August 2010, pp. 54-55.

¹¹⁴⁵ Vector Ltd., *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, 13 August 2010, pp. 26-27; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 15-23.

¹¹⁴⁶ Vector Ltd., *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, 13 August 2010, p. 27; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 12-23.

¹¹⁴⁷ KPMG, *Cross-Submission on GPBs (Input Methodology) Draft Reasons Paper*, *Cost of Capital*, 13 August 2010, pp. 4-6.

¹¹⁴⁸ Vector Limited, *Cross-submission to Commerce Commission on Gas Default Price-Quality Path: Issues Paper*, 31 May 2010, pp. 4-5.

¹¹⁴⁹ Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Guthrie G., *Measurement Error and Regulated Firms' Allowed Rates of Return: a report prepared for Transpower New Zealand Limited*, 14 August 2010, pp. 8-14; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Guthrie G., *Comments on the Commerce Commission's Input Methodologies Draft Reasons Papers: a report prepared for Telecom New Zealand Limited*, 12 August 2010, 12 August 2010, pp. 9-11; KPMG, *Cross-Submission on GPBs (Input Methodology) Draft Reasons Paper*, *Cost of Capital*, 13 August 2010, pp. 10-11.

This is similar to the Commission's estimate of 0.12 which was included in the EDBs Draft Reasons Paper.

Commission's response to submissions

H8.35 The Commission has carefully considered the submissions received and has undertaken further analysis on the asset beta and its standard error. In particular, the Commission has:

- explained below in greater detail its approach to applying its six-step process;
- identified additional comparable US electricity and gas utilities companies for inclusion in the analysis;
- expanded its analysis to cover a greater range of return periods (including weekly return data) and more sampling periods; and
- considered again the estimate of the standard error for the asset beta.

H8.36 The Commission's application of the six step process and the estimation of the standard error are outlined below.

Step 1: Identifying a sample of comparable firms

H8.37 The first step is to identify relevant comparable firms for inclusion in the sample. 'Comparable' means firms that have very similar exposure to market risk. In practice, in most New Zealand industries, it is difficult to find a sufficient number of comparable businesses to implement such an approach based solely on domestic data. Indeed, in some cases (e.g. electricity transmission), the entire industry consists of a single supplier. The sample of comparable firms includes overseas jurisdictions which have a larger number of similar firms.

H8.38 In previous electricity (and gas) decisions the Commission has been advised by Dr Lally on the sample of comparative firms used in the estimation of the asset beta.¹¹⁵¹ As there have been limited New Zealand electricity distribution and gas pipeline service providers available Dr Lally incorporated US electricity and gas utilities into the analysis. Dr Lally advised that the US electricity utilities were a comparator for the gas utilities, and vice versa, as firms from each sector appeared to have similar activities and regulations. Dr Lally favoured drawing upon both groups of US firms in drawing conclusions about asset beta for New Zealand gas pipeline businesses and electricity lines businesses.

H8.39 The notion that electricity distribution and transmission suppliers are comparable businesses to gas distribution and transmission suppliers, is consistent with the

¹¹⁵⁰ Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Guthrie G., *Measurement Error and Regulated Firms' Allowed Rates of Return: a report prepared for Transpower New Zealand Limited*, 14 August 2010, pp. 8-14.

¹¹⁵¹ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, November 2004; Lally, M., *The weighted average cost of capital for electricity lines businesses*, September 2005; Lally, M., *The weighted average cost of capital for gas pipeline businesses*, October 2008.

approach taken in Australia by the AER. In its draft decision for Jemena the AER stated that:¹¹⁵²

...the AER considers that the empirical evidence presented in the WACC review [2009 WACC review for electricity distribution and transmission networks¹¹⁵³] contains the best available estimate of the equity beta that would apply to a gas distribution network service provider. Although the WACC review was conducted in an electricity context, gas and electricity businesses are close comparators. Further, the sample set of data used to derive the equity beta is predominantly made up of gas businesses.

- H8.40 Only two companies on the New Zealand Stock Exchange operate electricity distribution services (Horizon Energy Ltd and Vector Ltd). This is too small a sample to estimate a reliable asset beta for EDBs/GPBs. Therefore, as with previous decisions, the Commission included overseas entities that are classified as integrated energy utilities in its sample of comparable firms. The Commission has included firms from Australia, the UK and the US in its sample.
- H8.41 The sample is displayed in Table H17 below which identifies if the firm was included in original sample, if the firm is classified as either an electricity utility or gas utility by Bloomberg¹¹⁵⁴ and the type of regulatory regime the comparative firm operates under.
- H8.42 The Commission considers this a representative sample of EDBs/GPBs. The sample contains US gas and electricity utilities and Australian and UK entities with both gas pipeline businesses and electricity lines businesses.. The US utilities contain suppliers that are vertically-integrated into electricity distribution, generation, transmission and/or retail services and horizontally-integrated into gas transmission and/or distribution services.
- H8.43 Given the size of the sample, the Commission did not consider it necessary to consider firms from other services/industries with a similar risk profile.

Comparative sample selection

- H8.44 Overseas firms that operate electricity distribution and gas pipeline businesses were identified based upon the Bloomberg classifications 'Electric – Distribution', 'Electric – Integrated', 'Electric – Transmission', 'Gas - Distribution' and 'Pipelines'. Any firms with either insufficient history as a listed entity (i.e. too few available data points) or a market value of equity below US\$100 million (i.e. small entities) were excluded from the sample.¹¹⁵⁵
- H8.45 For the remaining firms in the sample, to further assess comparability, Bloomberg's 'Segment Analysis' information was used to assess the nature and extent of electricity distribution / gas pipeline versus non-electricity distribution / gas pipeline services provided. As a result, any firms which the Commission did not consider were sufficiently comparable were also excluded from the sample.

¹¹⁵² AER, *Access arrangement proposal for the NSW gas networks - Jemena, Draft Decision, 1 July 2010-30 June 2015*, February 2010, p. 125.

¹¹⁵³ AER, *Final decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009.

¹¹⁵⁴ Bloomberg is a worldwide provider of financial and market information.

¹¹⁵⁵ Small firms may affect the empirical estimates of the asset beta due to the potential effect from thin trading volumes.

Table H17 Comparative firms sample used to derive the asset beta for EDBs, GPBs and Transpower

Name	Country	Included in IMs Draft Reasons Paper	Identified by Bloomberg as an Electricity utility	Identified by Bloomberg as a Gas utility	Regulatory Regime ¹¹⁵⁶
Horizon Energy	New Zealand	Yes	Yes		Incentive
Vector	New Zealand	Yes	Yes		Incentive
DUET	Australia	Yes	Yes		Incentive
Spark Infrastructure	Australia	Yes	Yes		Incentive
SP AusNet	Australia	Yes	Yes		Incentive
APA	Australia			Yes	Incentive
Envestra	Australia			Yes	Incentive
Hastings Diversified Utilities	Australia			Yes	Incentive
National Grid	UK	Yes	Yes		Incentive
Allegheny Energy	USA	Yes	Yes		Both
Allete	USA	Yes	Yes		
Alliant Energy	USA	Yes	Yes		Both
Ameren	USA	Yes	Yes		Incentive
American Electric Power	USA	Yes	Yes		Both
Avista Corp	USA		Yes		Incentive
Black Hills	USA	Yes	Yes		Incentive
Central Vermont Public Service	USA	Yes	Yes		
CH Energy	USA	Yes	Yes		Incentive
Cleco	USA	Yes	Yes		Incentive
CMS Energy	USA	Yes	Yes		Non-incentive
Consolidated Edison	USA	Yes	Yes		Both
Constellation Energy	USA	Yes	Yes		Both
Dominion Resources	USA	Yes	Yes		Both
DPL	USA	Yes	Yes		Non-incentive
DTE Energy	USA	Yes	Yes		Non-incentive
Duke Energy	USA	Yes	Yes		Non-incentive
Edison International	USA	Yes	Yes		Incentive
El Paso Electric	USA	Yes	Yes		Non-incentive
Empire District Electric	USA	Yes	Yes		Both
Entergy	USA	Yes	Yes		Both
Exelon	USA	Yes	Yes		Incentive

¹¹⁵⁶ The regulatory regime is identified by evaluating what states of the USA the utilities operates in and then matching this with the information from Kwoka, Table 1 and additional analysis by the Commission. Some utilities have not been identified as these utilities operate in a state(s) that has not been classified either in Kwoka or by the Commission. If a utility is subject to both forms of regulation it is marked by “both”.

Name	Country	Included in IMs Draft Reasons Paper	Identified by Bloomberg as an Electricity utility	Identified by Bloomberg as a Gas utility	Regulatory Regime ¹¹⁵⁶
FirstEnergy	USA	Yes	Yes		Both
Great Plains Energy	USA	Yes	Yes		Non-incentive
Hawaiian Electric	USA	Yes	Yes		
Idacorp	USA	Yes	Yes		
Integrus Energy	USA	Yes	Yes		Both
ITC Holdings	USA		Yes		Incentive
MGE Energy	USA	Yes			Incentive
NextEra Energy [formerly FPL Group]	USA	Yes	Yes		Incentive
Northeast Utilities	USA	Yes	Yes		Both
Northwestern Corp	USA		Yes		Both
NSTAR	USA	Yes	Yes		Incentive
NV Energy	USA	Yes	Yes		
OGE Energy	USA	Yes	Yes		Non-incentive
Pepco	USA	Yes	Yes		Both
PG&E	USA	Yes	Yes		Incentive
Pinnacle West	USA	Yes	Yes		Incentive
PNM Resources	USA	Yes	Yes		Non-incentive
PPL Corporation	USA	Yes	Yes		Both
Progress Energy	USA	Yes	Yes		Both
Public Service Enterprise	USA	Yes	Yes		Incentive
Scana Corp	USA	Yes	Yes		Non-incentive
Southern Corp	USA	Yes	Yes		Incentive
Teco Energy Corp	USA	Yes	Yes		Incentive
UIL Holdings Corp	USA	Yes	Yes		Non-incentive
Unisource Energy Corp	USA	Yes	Yes		Non-incentive
Unitil Corp	USA	Yes	Yes		Incentive
Westar Energy	USA	Yes	Yes		Incentive
Wisconsin Energy	USA	Yes	Yes		
Xcel Energy	USA	Yes	Yes		Both
AGL Resources	USA			Yes	
Atmos Energy Corp	USA			Yes	
Centerpoint Energy	USA			Yes	
Chesapeake Utilities Corp	USA			Yes	
Laclede Group	USA			Yes	
National Fuel Gas Co	USA			Yes	
New Jersey Resources Corp	USA			Yes	

Name	Country	Included in IMs Draft Reasons Paper	Identified by Bloomberg as an Electricity utility	Identified by Bloomberg as a Gas utility	Regulatory Regime ¹¹⁵⁶
Nicor Inc	USA			Yes	
Nisource Inc	USA			Yes	
Northwest Natural Gas Co	USA			Yes	
Oneok Inc	USA			Yes	
Piedmont Natural Gas Co	USA			Yes	
Sempra Energy	USA			Yes	
South Jersey Industries	USA			Yes	
Southwest Gas Corp	USA			Yes	
Spectra Energy Corp	USA			Yes	
UGI Corp	USA			Yes	
Vectren Corp	USA			Yes	
WGL Holdings Inc	USA			Yes	

Step 2: Estimating the equity beta of comparable firms

H8.46 The second step in the estimation process is to econometrically estimate the equity beta of each firm in the sample by regressing historical individual firm returns on historical market returns.¹¹⁵⁷ Each of these ordinary least squares estimators will be an unbiased estimator of the true equity beta of that firm, and the standard error of the estimate—a measure of its statistical precision—is readily obtained from the regression output.

H8.47 The Commission notes that, in the context of the Expert Panel report on the cost of capital, Professor Myers and Dr Lally recommended that for mature firms, the Commission check beta estimates, for example with a plot of rolling five-year betas, to reveal any short-term anomalies.¹¹⁵⁸

H8.48 The Commission previously received advice on the asset beta for the EDBs and GPBs from Dr Lally (the result of this analysis and how it compares to the current analysis are covered in paragraphs H8.65 to H8.68).¹¹⁵⁹ In this advice Dr Lally used different periods to evaluate the beta. Ultimately the Commission considers it is important to ensure that the beta is a fair measure of the underlying risk associated

¹¹⁵⁷ The Commission notes that consistent with the CAPM specification the correct methodology for estimating the equity beta would involve regressing excess returns of the individual firm against the excess returns of the market index. The estimation technique outlined in this paragraph is used by Bloomberg and is consistent with the estimation techniques used by many market practitioners. The returns of each firm in the sample are regressed against the market returns from the jurisdiction within which it is listed.

¹¹⁵⁸ Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, Report prepared for the Commerce Commission, 18 December 2008, pp. 24-26

¹¹⁵⁹ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, November 2004; Lally, M., *The weighted average cost of capital for electricity lines businesses*, September 2005; Lally, M., *The weighted average cost of capital for gas pipeline businesses*, October 2008.

with the supply of a service and not a product of a host of other possible measurement problems, such as infrequent trading.

H8.49 Therefore, for each firm in the sample of comparable firms, the Commission obtained from Bloomberg the unadjusted¹¹⁶⁰ equity beta estimate, the standard error of the estimate and the reported average leverage,¹¹⁶¹ for the following periods and observation intervals:^{1162, 1163}

- Five year period to 31 May 1995 using weekly and monthly observations
- Five year period to 31 May 2000 using weekly and monthly observations
- Five year period to 31 May 2005 using weekly and monthly observations
- Five year period to 31 May 2006 using weekly and monthly observations
- Five year period to 31 May 2007 using weekly and monthly observations
- Five year period to 31 May 2008 using weekly and monthly observations
- Five year period to 31 May 2009 using weekly and monthly observations
- Five year period to 31 May 2010 using weekly and monthly observations.

H8.50 The Commission’s approach is to estimate the beta over a range of periods which include and exclude the GFC (accepting the fluctuations of the markets as they actually are), without taking a view on whether or not the effects of the GFC will continue. While there is some evidence that asset betas showed some modest increases during the GFC, the asset betas are generally stable across the period.

Step 3: Turning the equity betas into asset betas

H8.51 The third step is to remove from each firm’s unadjusted equity beta estimate the effect of that firm’s average leverage by de-levering the equity beta estimate to

¹¹⁶⁰ The term ‘unadjusted’ refers to the absence of a Blume or Vasicek adjustment.

¹¹⁶¹ The average leverage was calculated as the unweighted arithmetic average of leverage at each financial year end for the same period as the observations used for the equity beta estimate (using the book value of net interest bearing debt and market value of equity).

¹¹⁶² Not all of the entities have data going back 20 years. The following table briefly summarises the number of entities by period:

Five year period to:	Non-US entities	US predominantly electricity distribution entities	US predominantly gas distribution entities
31 May 1995	0	43	16
31 May 2000	2	43	16
31 May 2005	4	48	18
31 May 2010	9	51	19

To determine whether the change in the sample over time had a material effect on the asset beta estimate for the total sample, the results from only those entities with a full 20 year history were also looked at. In the majority of cases, the asset beta estimates for the total sample (expressed to two decimal places) was unaffected. Where there was an effect, the majority of changes were 0.01.

¹¹⁶³ The results from the analysis of daily data were very similar to the results presented in this section.

arrive at an estimate of the firm's unadjusted asset beta. This allows the estimated asset beta for each firm to be directly compared with that for other firms without the effects of different levels of leverage.

- H8.52 A range of formulae have been developed as possible ways to de-lever and re-lever beta estimates. All of these formulae rely on making assumptions, including how firms manage their debt and the tax environment of the country in which the firm operates.
- H8.53 The two principal formulae that could be used in the current context are the Hamada formula and the tax-neutral formula.
- H8.54 The formula advocated by Hamada¹¹⁶⁴ assumes that (a) debt is fixed in dollar terms, and (b) that a classical tax system applies. The tax-neutral formula assumes that dividend imputation is fully effective and that capital gains are tax free. Miles and Ezzell¹¹⁶⁵ extended the formula advocated by Hamada to allow the assumption that leverage is fixed (rather than debt is fixed in dollar terms), whilst still assuming that a classical tax system applies. Removing the tax parameter from Miles and Ezzell formula results in a tax neutral formula.
- H8.55 The key concern raised by parties in relation to the de-levering and re-levering of betas was consistency in the formula used for doing so.¹¹⁶⁶

Conclusion - The approach to de-levering and re-levering

- H8.56 The Commission has previously used the Hamada formula to de-lever overseas betas, and the tax-neutral formula (equivalent to the Miles and Ezzell formula without taxes) to re-lever New Zealand betas, based upon the different respective tax systems in the relevant overseas countries and New Zealand. The Commission has, however, reconsidered this issue taking into account the assumptions used in the respective formulae regarding debt policy.
- H8.57 The Commission now considers that a formula without a tax term is appropriate because:
- inclusion of the tax term requires not only a classical tax regime but that debt is fixed in dollar terms (as opposed to leverage being fixed); and
 - the assumption that leverage rather than the dollar level of debt being fixed is the better assumption, which leads to the Miles and Ezzell formula, which is, in turn, close to a model without a tax term.
- H8.58 Expressed in terms of estimating an asset beta (i.e. in a form suitable for de-levering an equity beta estimate), the tax-neutral formula takes the form:

¹¹⁶⁴ Hamada, R. S., The Effect of the Firm's Capital Structure on the Systematic Risk of Common Stocks, *Journal of Finance*, 27(2), 1972, pp. 435-452.

¹¹⁶⁵ Miles, J. A. and J. R. Ezzell, The Weighted Average Cost of Capital, Perfect Capital Markets and Project Life: A Clarification, *Journal of Finance and Quantitative Analysis*, September, 1980, pp. 719-730.

¹¹⁶⁶ Commerce Commission, *Cost of Capital Workshop Transcript*, pp. 100-101; Charles River Associates, *Leverage and the Cost of Capital*, Report on behalf of Unison, 2 December 2009; NZ Airports Association, *Submission on the Revised Draft Guidelines*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital*, 2 December 2009, Appendix 2 and 3, pp. 82-91.

$$\beta_a = \beta_e(1-L) + \beta_dL$$

where β_a is the asset beta, β_e is the equity beta, β_d is the debt beta, and L is the leverage.

H8.59 Expressed in terms of estimating an equity beta (i.e. in a form suitable for re-levering an asset beta estimate), the tax-neutral formula takes the form:

$$\beta_e = \beta_a + (\beta_a - \beta_d)L/(1-L)$$

H8.60 Table H18 shows the average unadjusted asset beta estimates, over all sampling periods, for the sample of comparator firms.

Table H18 Average Unadjusted Asset Betas of Comparable Firms

Name	Average Unadjusted Asset Beta Monthly Observations	Average Unadjusted Asset Beta Weekly Observations
Horizon Energy	0.38	0.16
Vector	0.28	0.25
DUET	0.20	0.15
Spark Infrastructure	0.19	0.20
SP AusNet	0.16	0.10
APA	0.29	0.23
Envestra	0.14	0.10
Hastings Diversified Utilities	0.17	0.54
National Grid	0.24	0.30
Allegheny Energy	0.43	0.41
Allete	0.49	0.47
Alliant Energy	0.31	0.36
Ameren	0.33	0.36
American Electric Power	0.29	0.32
Avista Corp	0.30	0.29
Black Hills	0.50	0.42
Central Vermont Public Service	0.38	0.33
CH Energy	0.28	0.41
Cleco	0.43	0.41
CMS Energy	0.31	0.25
Consolidated Edison	0.15	0.26
Constellation Energy	0.41	0.39
Dominion Resources	0.22	0.27
DPL	0.36	0.38
DTE Energy	0.21	0.25

Name	Average Unadjusted Asset Beta Monthly Observations	Average Unadjusted Asset Beta Weekly Observations
Duke Energy	0.34	0.41
Edison International	0.30	0.37
El Paso Electric	0.27	0.39
Empire District Electric	0.26	0.26
Entergy	0.26	0.31
Exelon	0.29	0.41
FirstEnergy	0.19	0.32
Great Plains Energy	0.39	0.34
Hawaiian Electric	0.37	0.44
Idacorp	0.28	0.33
Integrys Energy	0.26	0.32
ITC Holdings	0.48	0.49
MGE Energy	0.23	0.36
NextEra Energy [formerly FPL Group]	0.27	0.31
Northeast Utilities	0.20	0.20
Northwestern Corp	0.42	0.43
NSTAR	0.22	0.28
NV Energy	0.40	0.29
OGE Energy	0.29	0.32
Pepco	0.26	0.39
PG&E	0.31	0.31
Pinnacle West	0.30	0.32
PNM Resources	0.43	0.36
PPL Corporation	0.29	0.33
Progress Energy	0.24	0.28
Public Service Enterprise	0.26	0.33
Scana Corp	0.24	0.29
Southern Corp	0.10	0.20
Teco Energy Corp	0.28	0.32
UIL Holdings Corp	0.35	0.34
Unisource Energy Corp	0.19	0.16
Unitil Corp	0.15	0.10
Westar Energy	0.32	0.27
Wisconsin Energy	0.17	0.24
Xcel Energy	0.35	0.31
AGL Resources	0.22	0.32
Atmos Energy Corp	0.20	0.30

Name	Average Unadjusted Asset Beta Monthly Observations	Average Unadjusted Asset Beta Weekly Observations
Centerpoint Energy	0.26	0.23
Chesapeake Utilities Corp	0.23	0.17
Laclede Group	0.15	0.33
National Fuel Gas Co	0.34	0.41
New Jersey Resources Corp	0.14	0.32
Nicor Inc	0.31	0.49
Nisource Inc	0.27	0.26
Northwest Natural Gas Co	0.15	0.27
Oneok Inc	0.32	0.37
Piedmont Natural Gas Co	0.20	0.35
Sempra Energy	0.43	0.49
South Jersey Industries	0.18	0.29
Southwest Gas Corp	0.19	0.28
Spectra Energy Corp	0.55	0.64
UGI Corp	0.21	0.32
Vectren Corp	0.23	0.36
WGL Holdings Inc	0.21	0.36
Mean (of all observations)	0.28	0.32

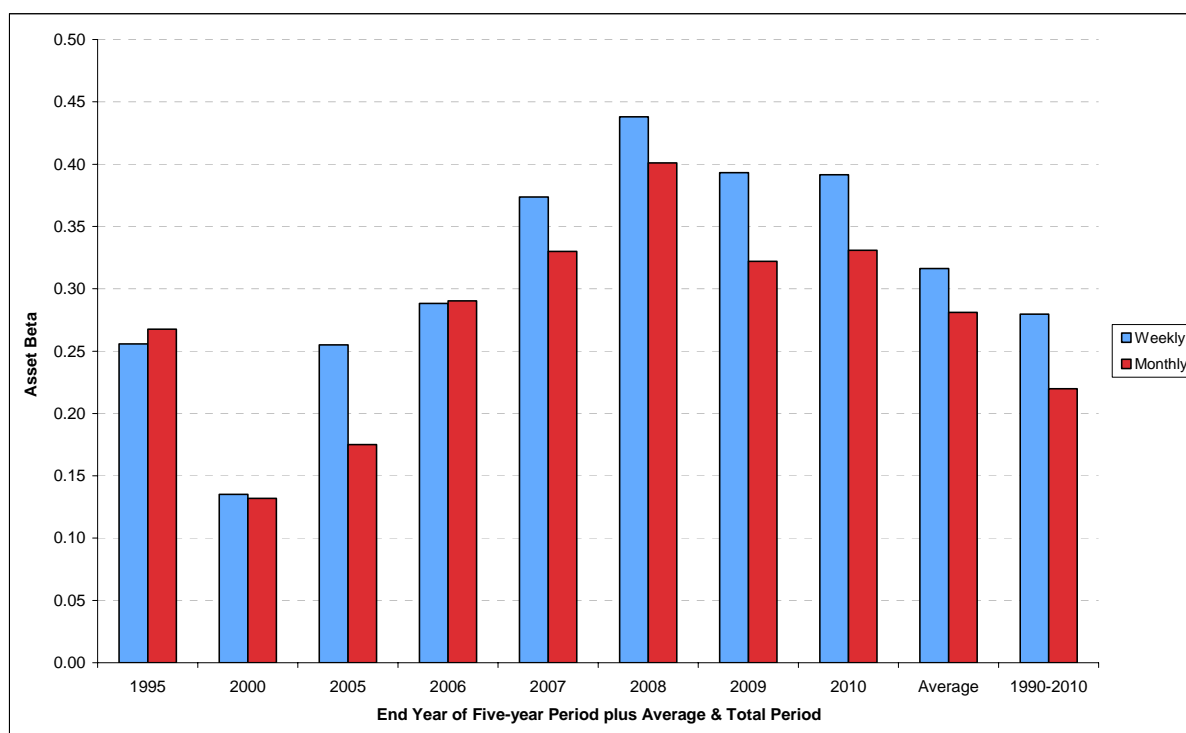
Step 4: Calculate the average asset beta of comparable firms

- H8.61 The fourth step is to estimate a ‘service-wide’ asset beta by taking an average of the individual unadjusted asset beta estimates of the comparable firms. As a starting point, each estimate receives an equal weighting.
- H8.62 As outlined in paragraph H8.49 above, the Commission investigated the effect on the asset beta estimate of different time periods and different observation intervals within each time period. The results are displayed in Figure H9 and summarised in Table H19. The Commission’s original unadjusted asset beta estimate of 0.34 is within the range of the averages obtained.

Table H19 EDBs Comparable Firms Unadjusted Average Asset Betas

	Average asset beta estimate	Average asset beta range
Monthly data	Overall 0.28 Gas 0.23 Electricity 0.30	0.13-0.40 0.13-0.38 0.11—0.41
Weekly data	Overall 0.32 Gas 0.31 Electricity 0.32	0.14-0.44 0.15-0.42 0.13—0.44
Monthly five-year periods 2005-2010	Overall 0.31 Gas 0.25 Electricity 0.33	0.18-0.40 0.13-0.38 0.19—0.41
Weekly five-year periods 2005-2010	Overall 0.36 Gas 0.36 Electricity 0.36	0.25-0.44 0.25-0.45 0.26—0.44

Figure H9 Unadjusted Average Asset Beta for Comparable Firms



H8.63 The results from this analysis indicate the average monthly asset beta is 0.28 and the average weekly asset beta is 0.32. Putting equal weight on each estimate results in an unadjusted asset beta estimate of 0.30.

H8.64 The Commission notes that the result displayed in Table H19 indicates that gas pipeline business have monthly asset beta estimates lower than the electricity

utilities. Prima facie this implies that overseas gas pipeline business face lower systematic risk than overseas electricity utilities.

Previous advice on asset betas for EDB/GPBs

H8.65 Dr Lally had previously advised the Commission on the asset betas for EDBs and GPBs.¹¹⁶⁷ He considered asset betas from New Zealand publicly listed EDBs/GPBs and a combination of US electricity and gas utilities.

H8.66 In the advice for EDBs Dr Lally estimates the asset betas based on US electricity utilities was 0.27, 0.22 for gas, and an overall asset beta of 0.26. For electricity utilities the range of asset betas was from 0.12 to 0.35, and for gas utilities the range of the asset beta was from 0.06 to 0.33.

H8.67 In his advice on the Gas Authorisation the asset betas based on US electricity utilities was 0.27, 0.23 for gas, and an overall asset beta 0.27. For electricity utilities the range of asset betas was from 0.03 to 0.36, and for gas utilities the range of the asset beta was from 0.04 to 0.33.

H8.68 On the basis of his analysis Dr Lally advised that prior to taking account of regulatory and other differences between the US and New Zealand, an asset beta of 0.30 was an appropriate estimate for the asset beta of US gas and electricity utilities and has been the starting point that should be applied for the previous gas and electricity decisions in New Zealand.

H8.69 In previous decisions, based on advice from Dr Lally, the Commission adopted an unadjusted asset beta of 0.30 for EDBs and GPBs.¹¹⁶⁸

Conclusion

H8.70 In its analysis for the Draft Reasons Paper the Commission estimated the value of the unadjusted asset beta for EDBs, GPBs and Transpower (and before any adjustments reviewed in Step 5) to be 0.34. The Commission has undertaken extensive subsequent analysis using different time periods and different observation intervals within each time period.

H8.71 The additional analysis confirms the Commission's original estimate of 0.34 included in the Draft Reasons Paper is a reasonable estimate of the asset beta for the sample. Indeed it could be argued, based on the broader range of time periods that were analysed, that an allowance of 0.34 is generous in favour of suppliers, and could be reduced to around 0.30 (the average of the weekly and monthly estimates), and is in line with the Commission's estimates in previous decisions. However, given the variability in the estimates, and that beta cannot be estimated with precision, the Commission considered the more prudent approach was to leave the estimate of the asset beta at 0.34 as proposed in the Draft Reasons Paper.

¹¹⁶⁷ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, November 2004, Table 3, p. 45; Lally, M., *The weighted average cost of capital for electricity lines businesses*, September 2005, Table 3, p. 45; Lally, M., *The weighted average cost of capital for gas pipeline businesses*, October 2008, Table 3, p. 59.

¹¹⁶⁸ See Commerce Commission, *Regulation of Electricity Lines Business – Target Control Regime Intention to Declare Control Unison networks limited*, 9 September 2005; Commerce Commission, *Gas Authorisation Decision Paper*, 2008, p. 172.

H8.72 The Commission has compared this estimate against the previous advice from Dr Lally. The Commission notes that its empirical analysis, which includes periods covering the GFC, yields an asset beta of 0.28 using monthly data, and 0.32 using weekly data. The result from the advice from Dr Lally on the asset beta, which does not cover the GFC, yields an asset beta of 0.26 or 0.27.

Step 5: Undertaking adjustments

H8.73 The Commission accepts the principle that there may be grounds for (a) making adjustments to multi-divisional asset betas estimates, (b) adjusting asset beta estimates sourced from overseas for differences in systematic risk due to regulatory differences, and (c) adjusting asset beta estimates due to differences in systematic risk between services.

H8.74 The Commission in the following sub-sections outlines how each of the considerations (i.e. Step 5(a), Step 5(b) and Step 5(c)), is used in sequence to adjust the basic asset beta estimate from Step 4.

Step 5(a): Making adjustments to multi-divisional asset betas estimates

H8.75 A company's overall beta can be viewed as a weighted average of the betas of its component businesses. The risk attached to a company's different businesses may vary considerably, and the weighted average gives the overall risk of the firm. Where multi-division firms are used in the Commission's empirical analysis, it may be necessary to extract an estimate of beta for a specific type of regulated service from the overall group beta.

H8.76 The task of estimating divisional betas is complicated by the fact that there are no traded returns for individual business units. Nevertheless, a number of approaches for estimating divisional betas have been proposed in the finance literature.¹¹⁶⁹ Of these, the Commission has narrowed the set to three possibilities:

- i. the 'pure play' approach;
- ii. the full information approach; and
- iii. econometric prediction based on risk-drivers.

H8.77 Under the 'pure play' approach, the Commission would identify traded stand-alone firms that are very similar across the fundamental risk drivers discussed above, and benchmark the division's beta to, for example, the average beta of a sample comprising these stand-alone firms. The main drawback of the 'pure-play' approach is that it requires 'pure-play' companies. In the case of EDBs, such 'pure-play' companies do not exist.

H8.78 The full-information approach exploits the idea that a multi-product firm is simply a portfolio of projects, and so its overall beta is a weighted average of the

¹¹⁶⁹ See, for example, Fuller, R. J., and H. S. Kerr, Estimating the Divisional Cost of Capital: An Analysis of the Pure-Play Technique, *Journal of Finance*, Vol. 36, No. 5, 1981, pp. 997–1009; Ehrhardt, M. C., and Y. N. Bhagwat, A Full-Information Approach for Estimating Divisional Betas, *Financial Management*, Vol. 20, No. 2, 1991, pp. 60–69; Grinblatt, M., and S. Titman, *Financial Markets and Corporate Strategy*, 2nd edition, McGraw-Hill: New York, 2002, pp. 390–391; Brealey, R., and S. C. Myers, *Principles of Corporate Finance*, 7th ed., McGraw-Hill/Irwin: New York, 2003, pp. 237–238.

unobservable betas of its individual business units.¹¹⁷⁰ The asset betas are then estimated using econometric techniques.

- H8.79 The third technique—the econometric investigation of risk-drivers—involves estimating a beta equation, specified as a function of potential drivers of asset betas.
- H8.80 The main disadvantage of the full information approach and econometric prediction based on risk-drivers is that they require a large amount of high-quality data.
- H8.81 The applicability and performance of these techniques will depend on the data available, so no one approach can be recommended in all instances.

Conclusion - making adjustments to multi-divisional asset beta estimates

- H8.82 The comparator companies are generally not pure plays. That is, they can have a mix of activities (e.g. gas transmission/distribution and electricity transmission/distribution) as well as some activities that are not subject to regulation under part 4 (e.g. electricity generation). The services that would not be subject to regulation under Part 4 are a small proportion of their total business. On average, therefore, the asset beta for these comparator companies is likely to reflect a similar degree of systematic risk as could be expected for EDBs, GPBs and Transpower.
- H8.83 Overall, the Commission does not consider an adjustment for the other business activities of the comparator firms is necessary as there is no evidence or reason to consider that the average asset betas of the comparator group would be unrepresentative of the asset beta for EDBs, GPBs and Transpower.¹¹⁷¹
- H8.84 The Commission's estimated asset beta for EDBs and Transpower (and the raw asset beta for GPBs) is in line with previous advice by Dr Lally which has been applied previously by the Commission (see paragraphs H8.65 to H8.69); and with other available estimates of the asset betas for similar services (see paragraph H8.208).

Step 5(b): Adjusting for differences in systematic risk due to regulatory differences

- H8.85 Due to the limited number of relevant listed firms in New Zealand, i.e. Horizon Energy an EDB and Vector an EDB/GPB, the Commission has had to look to comparable electricity and gas utilities from overseas. These overseas firms are subject to regulatory regimes that may differ to New Zealand's regime.
- H8.86 Inevitably, regulatory regimes applied to sectors may differ across and between countries. A key question relevant to beta estimation, and the transferability of overseas beta estimates to the New Zealand context, is whether different types of regulation systematically affect the ability of suppliers of regulated services to reduce their exposure to fluctuations in the economy (i.e. affects the providers in terms of their sensitivity to systematic risk). If yes, the next question is how any adjustment to the asset beta estimate should be made.

¹¹⁷⁰ Ehrhardt, M. C., and Y. N. Bhagwat, A Full-Information Approach for Estimating Divisional Betas, *Financial Management*, Vol. 20, No. 2, 1991, pp. 60–69; Wood, R. A., T. H. Mcinish, and K. D. Lawrence, Estimating Divisional Betas with Diversified Firm Data, *Review of Quantitative Finance and Accounting*, Vol. 2, No. 1, 1992, pp. 89–96; Kaplan, P. D., and J. D. Peterson, Full-Information Industry Betas, *Financial Management*, Vol. 27, No. 2, 1998, pp. 85–93.

¹¹⁷¹ The exposure to systematic risks of GPBs is considered further at paragraphs H8.167 to H8.182.

The theory of regulatory regimes and differences in systematic risk

- H8.87 In theory, different regulatory regimes can allocate risks differently between the regulated supplier (i.e. shareholders) and consumers.
- H8.88 If the regulatory regime is such that it insulates the regulated supplier from the effect of any shocks to the economy, then the returns that are achieved will only be weakly correlated with market returns and the supplier will be exposed to less systematic risk, which will be reflected in a lower asset beta. Such an outcome is more likely to emerge if regardless of any shock that uncontrollably decreases demand or increases the cost of the service, the regulated price that is charged is simply adjusted by the regulator so that there is little, if any, effect on the return that the regulated supplier earns.
- H8.89 Extreme forms of cost-of-service or rate-of-return regulation will in theory result in the regulated supplier bearing minimal systematic risk. This arises as any increase in cost is immediately passed through to the consumer by the regulatory authority and will not be borne by the supplier, and conversely, any benefit of decreased cost will not be realised by the supplier, but will be immediately passed through to the consumers by the regulatory authority.¹¹⁷² As the regulated supplier under such a scheme earns almost the same return regardless of its costs or any changes in demand, it is argued that cost-of-service or rate-of-return regulation (also known as cost-plus regulation) creates ‘low-powered’ incentives for suppliers to keep costs down. In fact, Joskow notes that under rate-of-return regulation:¹¹⁷³
- ...the regulatory agency sets the prices of services and not rates of return. Once the prices for utility services are set by the regulatory authority, they remain at fixed levels until they are officially increased or decreased by action of that regulatory authority.
- H8.90 Established through the US judicial system, rate-of-return regulation was the traditional form of regulation that applied to many services supplied by regulated utilities in the US from the mid-1940s. While in practice, under rate-of-return regulation, price was set to recover costs, as regulated suppliers or customers generally had to apply for price adjustments through a rate hearings process, there was normally a considerable lag between the time the cost has decreased/increased and the time the discount/higher cost was passed through to customers (i.e. the ‘regulatory lag’). Joskow observed that this regulatory lag could last between 18-24 months.¹¹⁷⁴
- H8.91 Consequently, compared to the scenario of perfect cost pass-through, rate-of-return regulated suppliers are potentially exposed to greater systematic risk. Further, the longer the regulatory lag lasts, the greater this level of risk exposure. For example, the existence of the regulatory lag means that the regulated supplier will in the interim be able to make above the normal allowed rate of return, providing

¹¹⁷² Guthrie, G., Regulating Infrastructure: The Impact on Risk and Investment, *Journal of Economic Literature*, Vol. 44, 2006, pp. 925-972. Guthrie on p. 937 states that: “Rate of return regulation immunizes shareholders from shocks to long-term cash flows because prices will be adjusted at future hearing to allow the firm to recover its costs.”

¹¹⁷³ See p. 118, Joskow, P, Pricing Decision of Regulated Firms: A Behavioral Approach, *Bell Journal of Economics*, Vol. 4, 1973, pp. 118-140.

¹¹⁷⁴ *ibid*, p. 121.

incentives for performance. Kahn saw the existence of the regulatory lag as a positive for the regulatory regime, stating that:¹¹⁷⁵

... the regulatory lag-the inevitable delay that regulation imposes in the downward adjustment of rate levels that produce excessive rates of return and in the upward adjustments ordinarily called for if profits are too low-is thus to be regarded not as a deplorable imperfection of regulation but as a positive advantage.

- H8.92 If in contrast to pure cost-of-service or rate-of-return regulation, the regulatory regime instead increased the exposure of the regulated supplier to shocks to the economy, then the returns will be more strongly correlated with market returns and the supplier will face greater systematic risks. This will be reflected through a higher asset beta. Such an outcome is more likely to arise where the regulatory regime fixes prices for a long period of time. That is, the supplier that is subject to fixed-price regulation benefits from any uncontrollable increases in demand or decreases in costs that occurs, but is exposed to any losses that arise due to any decreases in demand or increases in cost until such a time when the fixed price is reset. At the time of the price reset consumers bear the consequences of any decreases in demand and increases in cost.¹¹⁷⁶
- H8.93 In theory, pure forms of price-cap regulation (also known as CPI-X or RPI-X regulation)¹¹⁷⁷ will generate outcomes where the regulated supplier will bear the risk of any increase in the cost, while the consumer price remains unaffected. As the supplier can potentially earn higher than normal returns over a period for which the price is fixed, such regulation creates ‘high-powered’ incentives for suppliers to keep costs down. Price-cap regulation is therefore sometimes referred to as a form of incentive-based regulation or a form of performance-based regulation (PBR).
- H8.94 Price-cap regulation was introduced in the UK in the mid 1980s with the deregulation of the traditional statutory monopolies supplying utility services. The first price cap was introduced in the UK in 1984, and applied on the retail services supplied by the telecommunications incumbent supplier British Telecom. These caps have since evolved to be applied not only on price, but also on revenue, and across retail and wholesale services.
- H8.95 The reset of the price cap under price-cap regulation often involves similar considerations to the reviews that are used under rate-of-return regulation. The shorter the regulatory period is, the more price-cap regulation converges towards a form of rate-of-return regulation,¹¹⁷⁸ and consequently, the lower the level of systematic risk that the regulated supplier is likely to be exposed to.

¹¹⁷⁵ See Kahn, A.E., *The Economics of Regulation, Volume II - Institutional Issues*, MIT Press, 1988, p. 48.

¹¹⁷⁶ Guthrie, G., *Regulating Infrastructure: The Impact on Risk and Investment*, *Journal of Economic Literature*, Vol. 44, 2006, pp. 925-927.

¹¹⁷⁷ RPI - X (or CPI - X) regulation is a form of price cap regulation that in its basic form requires that the price index for a defined basket of the regulated supplier’s services should increase by no more than the retail (or consumer) price index minus some “X” per cent per annum for a set period of years. Where X is positive (negative) it implies that the average price for regulated services must fall (rise) in real terms by at least X per cent. The so called “X factor” is often based on a productivity measure, although regulators will also often set or reset X by taking into consideration the cost of capital.

¹¹⁷⁸ Liston, C, *Price-Cap versus Rate-of-Return Regulation*, *Journal of Regulatory Economics* 5, pp. 25-48.

H8.96 Variants of price caps have been introduced, such as revenue caps and partial price caps, involving a mix of the two. Where a large proportion of the costs associated with the supply of a service are fixed (e.g. transmission costs), a large fluctuation in demand under price-cap regulation can expose the firm to large changes in revenue whilst overall costs remain unchanged. Alexander, Mayer and Weeds (Alexander et al.)¹¹⁷⁹ noted that revenue caps provide a means to mitigate the risks firms face when there are such large fixed costs, and such regulations were introduced in the UK in the early 1990s in the electricity transmission sector. In practice, Alexander et al. outlines that a form of hybrid regulation has evolved, so that fixed costs are dealt with through revenue caps, and variable costs dealt with through price caps.¹¹⁸⁰

H8.97 The Commission accepts in principle that regulatory regimes can allocate risks differently and expose regulated suppliers to different systematic risks. Therefore adjustments may need to be made to asset beta estimates in order to account for such differences that might arise. However, before that can be done, there needs to be evidence that in practice the regulatory regimes allocate risks differently. This will need to be based on empirical estimates of average asset betas that differ where different regulatory regimes exist, and an assessment of the types of regulatory regimes that are currently in place in different countries.

Empirical evidence of regulatory differences and differences in systematic risk

H8.98 Empirical analysis by Alexander, Mayer and Weeds (Alexander et al.)¹¹⁸¹ using data between 1990-1995, showed that different regulatory regimes appeared to affect the level of shareholder risk for regulated suppliers across a number of countries for a number of different services – electricity, gas, energy, water and telecommunications.¹¹⁸² Their results suggested that high-powered incentive schemes, such as price-cap or RPI-X regulation, resulted in higher systematic risks compared with low-powered incentive schemes, such as rate-of-return regulation.

H8.99 In particular, when comparing data between 1990-1995 for services across the UK, (where variants of price-cap regulation have been used since the mid 1980s), with services across the US (where rate-of-return regulation has traditionally been employed for most services since the 1940s), Alexander et al. found that the estimated average asset beta across all services in the UK was at least two times that of the US.¹¹⁸³ For the electricity sector the average asset beta estimated for the UK was 0.6, while the average asset beta estimated for the US was 0.3.

H8.100 Alexander et al. concluded in relation to their results from comparing the regulatory regimes:¹¹⁸⁴

Regimes with low-powered incentives tend to coexist with low asset beta values, while high-powered incentives imply significantly high beta values. These results, in accordance with existing comparison of regulatory regimes, seem to imply that

¹¹⁷⁹ Alexander, I, Mayer, C., and Weeds, H. Regulatory Structure and Risk: An International Comparison, Policy Research Working Paper 1698, The World Bank, December 1996, p. 10.

¹¹⁸⁰ *ibid.*, p. 11.

¹¹⁸¹ Alexander, I, Mayer, C., and Weeds, H. Regulatory Structure and Risk: An International Comparison, Policy Research Working Paper 1698, The World Bank, December, 1996.

¹¹⁸² *ibid.*

¹¹⁸³ *ibid.*, pp. 27-28.

¹¹⁸⁴ *ibid.*, p. 30.

companies under RPI-X regulation are exposed to much higher levels of systematic risk in comparison with those under rate-of-return regulation, and that the cost of capital for these firms is therefore likely to be higher.

- H8.101 Nevertheless, the authors indicated that their results should not be accepted without caveats. The authors noted that drawing comparisons between beta values on an international scale was difficult as each country's stock was being compared against a different market index. As indices differed in composition and were calculated differently, it introduced a possible source of non-comparability. One example highlighted was that in countries where the utility companies formed a large proportion of the total market capitalisation, the index would reflect movements in utility shares and the estimated beta will be higher.¹¹⁸⁵
- H8.102 Alexander et al. noted that additionally national stock markets operated in different ways and were prone to different degrees of interval bias. For example, UK utilities tended to be large relative to the market as a whole, whereas US utilities were typically smaller regionally-based businesses. For this reason, estimated beta values could be expected to overstate the degree of market risk borne by UK utilities while risk incurred by US utilities would be understated. Similarly, the authors outlined that the much-quoted difference between US and UK utility betas, usually attributed to difference in regulatory risk, may simply reflect the systematic interval-effect biases that are present in these estimates.¹¹⁸⁶
- H8.103 Further, Dr Lally has noted that beta estimates from different countries may be affected by differences in market leverage. Dr Lally showed that a significant proportion of the difference in the estimated asset betas for US and UK electricity utilities in the early 1990s was due to differences in market leverage of these businesses in the US and the UK.¹¹⁸⁷
- H8.104 The findings of Alexander et al. have been used to provide support for adjustments made by Dr Lally when providing expert advice to the Commerce Commission on EDBs' asset betas.¹¹⁸⁸
- H8.105 In estimating the EDBs' asset betas in 2005 and GPBs' asset beta in 2004 and 2008, Dr Lally considered asset betas from New Zealand publicly listed EDBs and a combination of US electricity and gas utilities. As he relied primarily on the data from US utility companies subject to rate-of-return regulation to estimate an asset beta of 0.30, Dr Lally recommended that there should be an upward adjustment to account for the more incentive-based nature of regulation used in New Zealand and to reflect the length of time between price resets.
- H8.106 However, the results from research by Buckland and Fraser on the beta sensitivity in UK electricity distribution brings in to question the results from Alexander et al.¹¹⁸⁹

¹¹⁸⁵ *ibid*, p. 31.

¹¹⁸⁶ *ibid*, p. 31.

¹¹⁸⁷ Lally, M., Betas and Market Leverage, *Accounting Research Journal*, Vol. 15, 2002, pp. 91-97.

¹¹⁸⁸ Lally, M., *The weighted average cost of capital for electricity lines business*, September 2005.

¹¹⁸⁹ Buckland, R., and P. Fraser, Political and Regulatory Risk: Beta Sensitivity in U.K. Electricity Distribution, *Journal of Regulatory Economics*, Vol. 19, 1, 2001, pp. 5-25.

- H8.107 Buckland and Fraser analysed 12 privatised UK electricity utilities betas over a period from December 1990 through to December 1998. They found that the period from 1990 to 1995 was influenced by two significant events (one political and one regulatory) that biased upwards the beta estimate over this period (this is the same period considered by Alexander et al.).
- H8.108 The first of these events was the effect of political uncertainty that was observable first on April 1, 1992 and did not subside until October 1992 when the betas return to their previous levels.¹¹⁹⁰
- H8.109 The second event occurs in the period 1994-1995 where spikes and shifts occurred in the betas. Buckland and Fraser comment that this change in the risk occurs contemporaneously with the regulators (Office of Electricity Regulation (Offer), superseded by Ofgem in 1999) shifts over amendments to the published distribution price review.
- H8.110 The Commission considers that the result of these two events would bias upwards the beta estimate over the period considered by Alexander et al., thereby bringing into question the results of their study and the appropriateness of the previous adjustment below for regulatory difference.

Electricity

- H8.111 In advice for the Unison Post-Breach Inquiry Dr Lally considered that as New Zealand had a form of price-cap regulation it would affect the systematic risk of an EDBs (i.e. asset beta) and estimated that an adjustment of 0.10 should apply to account for this regulatory difference. The Commission adopted an adjusted asset beta of 0.4.¹¹⁹¹
- H8.112 Dr Lally's approach was criticised by Boyle, Evans and Guthrie, (Boyle et al.) who indicated that:¹¹⁹²
- the sample US electricity utilities operated other services as well as regulated electricity services;
 - the structure of the US electricity industry had changed and that many state regulators had adopted incentive regulation. Lally's claim that US electricity utilities are subject to rate-of-return regulation with annual resetting of prices was a gross over-simplification and ignored the incentive regulation implemented in many states; and
 - it was incorrect that rate-of-return regulated firms are reviewed annually.

¹¹⁹⁰ Buckland and Fraser found a similar result for UK water; see Buckland, R., and P. Fraser, Political and Regulatory Risk in Water Utilities: Beta Sensitivity in the United Kingdom, *Journal of Business Finance & Accounting*, Vol. 28, Issue 7-8, 2001, pp. 877-904.

¹¹⁹¹ *ibid*, p. 47; Commerce Commission, *Regulation of Electricity Lines Businesses Targeted Control Regime, Reasons for Not Declaring Control, Unison Networks Limited*, 11 May 2007, pp. 39-39.

¹¹⁹² Boyle, G., Evens, L., and Guthrie, G., *Estimating the WACC in a Regulatory Setting*, New Zealand Institute for the Study of Competition and Regulation, March 2006, pp. 20-31.

Gas

- H8.113 In advice on the Gas Control Inquiry and Gas Authorisation Dr Lally considered that as New Zealand had a form of price-cap regulation it would affect the systematic risk of the GPBs (i.e. asset beta).¹¹⁹³ Dr Lally estimated that if New Zealand entities were subject to a five-year price cap, an upward adjustment of 0.20 should be applied to the estimated rate-of-return regulated asset beta of 0.3, to account for the regulatory difference. This resulted in an asset beta of 0.50, before any other adjustments were made.
- H8.114 Dr Lally further considered that the period of the price cap would affect the asset beta. If the price cap was less than five years he argued that a regulated business would face less risk and any upward adjustment to the asset beta would be lower. He maintained that as rate-of-return regulation was equivalent to a one-year price cap, it should have an asset beta of 0.30. Using asset beta estimates for the one-year and five-year periods of price-cap regulation, Dr Lally scaled the asset beta estimate to match the regulatory period applied to GPBs in New Zealand.¹¹⁹⁴
- H8.115 In the Gas Authorisation the GPBs were subject to a seven-year price-cap from 2005-2012. However, since the Commission was making the decision in 2008 it proposed to break the seven years into two periods, three years (2005-2008) followed by four years (2008-2012). This meant that it effectively imposed a three-year price cap and four-year price cap on the GPBs.
- H8.116 In estimating the asset beta for the three-year and four-year price caps, Dr Lally used linear interpolation between the asset beta of 0.30 and the asset beta of 0.50. This resulted in an estimate for the asset beta of 0.40 for the three-year price cap, and 0.45 for the four-year price cap.
- H8.117 Recognising the seven-year period of price-cap regulation was being split into a three-year and a four-year period, Dr Lally estimated the asset beta to apply for the Gas Authorisation by then placing weights of 3/7th on the asset beta of 0.4 and 4/7th on the asset beta of 0.45. This resulted in a final asset beta recommendation for the Gas Authorisation, only incorporating changes for different regulatory regimes, of 0.43.
- H8.118 While the Commission considers that regulatory differences can affect the systematic risks faced by the regulated suppliers, and has previously adjusted US estimates upward to account for regulatory differences, it finds that in contrast to previous evidence (e.g. Alexander et al.), the current asset beta estimates in Table H18 for US electricity utilities now appear to be similar and in some cases higher than the estimates from the UK, Australia and New Zealand.
- H8.119 That is, whilst the Commission estimated an average EDB asset beta for the US integrated electricity and gas utilities of 0.29, with a range from 0.10-0.55, Ofgem in

¹¹⁹³ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, November 2004, pp. 44-46; Lally, M., *The weighted average cost of capital for gas pipeline businesses*, October 2008, p. 59, pp. 60-62.

¹¹⁹⁴ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, October 2008, p. 59, pp. 133-134 and 139-144.

- its most recent electricity price control review, evaluated the appropriate asset beta for electricity distribution sector in the UK to be in the range 0.24-0.34.¹¹⁹⁵
- H8.120 The Ofgem result was based on evidence provided by PwC UK. The PwC UK data primarily used a UK comparator sample in order to avoid any distortions caused by differences in regulatory risk across different countries.¹¹⁹⁶ The sample included three energy companies—National Grid (electricity and gas distribution/transmission), Scottish and Southern Energy (electricity distribution/transmission and retail/generation) and Scottish Power (electricity distribution/transmission), as well as four UK traded water/sewerage companies—United Utilities, Severn Trent, Pennon and Kelda.¹¹⁹⁷
- H8.121 PwC UK estimated unadjusted and adjusted (using Blume) asset betas for different periods and different frequencies (five-yearly with monthly, three-yearly with weekly and two-yearly with daily) as well as incorporating a debt beta of zero and 0.1. PwC UK identified the adjusted asset beta for the UK was in the range of 0.31 to 0.38 (with an average of 0.34). As a cross-check on the UK sample PwC UK used 14 international electricity and gas utilities, which were a mixture of electricity and gas distribution and transmission services.¹¹⁹⁸ PwC UK's analysis indicated an adjusted asset beta range for the international suppliers of 0.21 to 0.46 (with an average of 0.31), and it considered this range to be broadly in line with the range estimated for the UK sample.¹¹⁹⁹ On the basis of these findings PwC UK recommended, for the UK EDBs', a range for the asset beta of 0.31 - 0.38 and a range for the equity beta of 0.5 - 1.1.
- H8.122 In Australia, the implied asset beta of the AER for electricity distribution and transmission network providers (where revenue-cap regulation is in place for electricity transmission¹²⁰⁰ and a combination of price and revenue caps are in place for electricity distribution¹²⁰¹) was 0.32. For the five-year period ending 2010 the Commission has estimated asset betas for the sample of Australian entities that range from 0.16-0.31, and for New Zealand entities that range from 0.18-0.28.
- H8.123 As in the final cost of capital decision for the AER electricity distribution and transmission network suppliers, the AER in a number of gas distribution decisions since 2009 has adopted the equity beta of 0.8, and thus used an implied asset beta of 0.32, using the tax-neutral de-leveraging formula.¹²⁰² The AER adopted the equity beta of 0.8 despite recognising that its best estimate of the equity beta for the gas

¹¹⁹⁵ Ofgem, *Electricity Distribution Price Control Review Final Proposal*, 7 December 2009, pp. 52 and Ofgem, *Electricity Distribution Price Control Review Final Proposal - Allowed Revenues and Financial Issues*, 7 December 2009.

¹¹⁹⁶ PricewaterhouseCoopers, *Advice on the cost of capital analysis for DPCR5, Final Report to the Office of Gas and Electricity Markets*, 28 July 2009.

¹¹⁹⁷ *ibid.*, pp. 34-41.

¹¹⁹⁸ *ibid.*, pp. 42-48.

¹¹⁹⁹ *ibid.*, p. 48.

¹²⁰⁰ See p. 132, AER, *State of the Energy Market 2009*, 8 December 2009, Chapter 5, pp. 124-151.

¹²⁰¹ See Table 6.2, p. 163, AER, *State of the Energy Market 2009*, 8 December 2009, Chapter 6, pp. 122-189.

¹²⁰² AER, *Access arrangement proposal for the NSW gas networks - Jemena, Final Decision*, June 2010, p. 173. In this decision the equity beta was estimated as 0.8, a notional leverage assumption of 60% adopted, and a debt beta of zero was used.

- distribution service was between 0.4-0.7.¹²⁰³ Applying the tax-neutral de-levering formula, this implies the best estimate of asset betas for gas distribution businesses of 0.16-0.28. The AER used the figure of 0.8 as it concluded a conservative approach had merit and provided the supplier with a reasonable opportunity to at least cover efficient costs.
- H8.124 Prior to the AER taking over the economic regulation of the electricity distribution networks on 1 January 2008 and the gas distribution networks on 1 July 2008, these economic regulatory functions in Australia lay with the States. The AER in its 2009 decision on the WACC parameters for electricity distribution and transmission, noted that the asset betas used by the State-based regulators for gas distribution services had ranged between 0.30-0.55, while equity betas ranged between 0.7-1.1.¹²⁰⁴
- H8.125 The lower bound for the range was based on the Essential Services Commission (ESC) final decision for gas distribution suppliers in Victoria. In estimating the cost of capital it reduced the equity beta from 1.0 to 0.70. Although no decision was made with regards to the debt beta, given the notional level of leverage of 60% used and a debt beta of zero, the tax-neutral de-levering formula implies an asset beta of 0.28. In order to reduce the effect of the decrease in the equity beta, however, the ESC provided for an allowance in each distributor's total revenue, which effectively meant that the estimate for the equity beta was 0.8, which would imply an asset beta of 0.32.¹²⁰⁵
- H8.126 The upper bound of the range, the equity beta of 1.1 and the implied asset beta of 0.55, was as a result of a decision by the Queensland Competition Authority (QCA) for the gas distribution businesses in 2006.¹²⁰⁶
- H8.127 For the EDBs Draft Reasons Paper, the Commission estimated that the asset betas for the sample of Australian entities ranged from 0.10-0.20, and for New Zealand entities ranged from 0.18-0.29. When the Commission added to the Australian sample the other predominantly gas businesses, and excluded the electricity-only supplier Spark Infrastructure, the estimated range increased from 0.10-0.31.
- H8.128 The results have led the Commerce Commission to consider further whether or not the differences previously identified between the regulatory regimes in the US and UK currently exist in practice, and how the current New Zealand default/customised price-quality regulation compares to these overseas regulatory regimes.

¹²⁰³ *ibid.* A similar finding was also made by the AER when examining the equity beta for electricity distribution and transmission. That is, the underlying analysis commissioned by the AER, indicated a lower equity beta than the equity beta of 0.8 that was adopted, which implies (using the tax-neutral de-levering formula) an asset beta of lower than 0.32. See, Ólan, T. H., *Estimating β* , Report to ACCC, 23 April 2009; AER, *Electricity Transmission and Distribution Network Service Providers - Review of the Weighted Average Cost of Capital (WACC) Parameters, Final Decision*, May 2009.

¹²⁰⁴ AER, *Final decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009, p. 242, Table 8.2.

¹²⁰⁵ Essential Services Commission, *Gas Access Arrangement Review 2008-2012*, Final Decision, 7 March 2008.

¹²⁰⁶ QCA, *Revised Access Arrangement for Gas Distribution Networks: Allgas Energy*, May 2006; QCA, *Revised Access Arrangement for Gas Distribution Networks: Envestra*, May 2006. The QCA in both decisions assumed a debt beta of 0.12 and used the Conine Levering formula, replacing the corporate tax rate term with the imputation-adjusted tax rate. (See QCA, *Revised Access Arrangement for Gas Distribution Networks: Envestra*, May 2006, p. 103).

The regulatory framework in the US, UK and New Zealand

H8.129 The US and UK are often painted as using two diametrically opposed regulatory regimes. The US is viewed as implementing a low-powered incentive-based rate-of-return regulation, whilst the UK is portrayed as implementing a high-powered incentive-based price-cap regulation.

H8.130 However, this ignores the fact that the actual differences between the two types of regulations may be minimal. Further, there appears to have been an increased move towards more incentive-based regulatory regimes in the US, and a move in the UK to reduce the risks associated with RPI-X.

H8.131 In assessing incentive regulation in theory and in practice in electricity distribution and transmission networks, Joskow contrasted the revenue-cap regulation used in the UK with the cost-of-service regulation developed in the US. He found that in comparing the two regimes there were actually many similarities between them, stating that:¹²⁰⁷

...I believe that there is less difference than may first meet the eye. The UK's implementation of a price cap based regulatory framework is best characterized as a combination of cost-of-service regulation, the application of a high powered incentive scheme for operating costs for a fixed period of time, followed by a cost-contingent price ratchet to establish a new starting value for prices. The inter-review period is similar to "regulatory lag" in the U.S. context...except it is structured around a specific RPI-x formula that employs forward looking productivity assessments that allows for automatic adjustments for inflation and has a fixed duration. A considerable amount of regulatory judgment is still required by OFGEM.

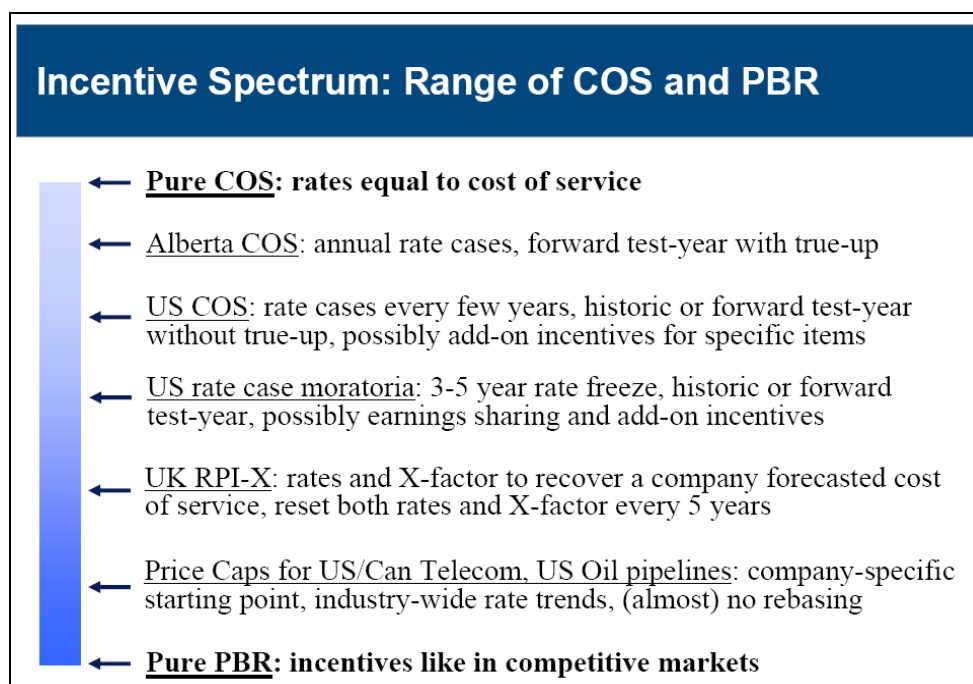
H8.132 Further, Joskow noted that due to the existence of a 'regulatory lag', cost-of-service regulation created a similar incentive for suppliers to decrease costs as under incentive-based regulation. However, unlike incentive-based or performance-based regulation this was more a consequence of the impracticality of having frequent price reviews and changing economic conditions, than by design.

H8.133 The convergence of UK RPI-X and the US cost-of-service regulations highlighted by Joskow and noted by Boyle et al., has also been acknowledged by Pfeifenberger, who in the following diagram contrasted the incentive spectrum between the high powered or pure incentive-based or performance-based regulations (PBR) and the very low powered pure cost-of-service (COS) regulation.¹²⁰⁸

¹²⁰⁷ Joskow, P.L., Incentive Regulation in Theory and Practice: Electricity Distribution and Transmission Networks, A Paper Prepared for the National Bureau of Economic Research Conference on Economic Regulation, 9-10 September, 2005, p. 44.

¹²⁰⁸ Pfeifenberger, J., Incentive Regulation: Introduction and Context, Presentation at AUC PBR Workshop, Edmonton, Alberta, May 26-27, 2010, slide 10.

Figure H10 Incentive spectrum between PBR and COS regulation¹²⁰⁹



H8.134 While the US was traditionally subject to rate-of-return regulation across all sectors, by the 1990s a number of states had started to look to using forms of incentive regulation for telecommunications. By 2000, 40 states had price-cap regulation in place for telecommunications and four states had other forms of incentive regulation.¹²¹⁰ Similarly, Kwoka shows that this movement towards incentive-based forms of regulation has also been occurring in electricity regulation in the US. When state-based regulators were asked the question whether or not a form of incentive-based regulation was used, 20 state regulators answered yes, whilst 19 responded that it was not being used.¹²¹¹ This is consistent with the analysis of Boyle et al.¹²¹² which noted that the structure of the US electricity industry had changed and that many of the state regulators in the US had adopted incentive-based regulation.

H8.135 Using the information in Kwoka the Commission has further surveyed the remaining state electricity regulators that Kwoka did not have information for. The Commission increased the sample of known regulatory regimes from the 38 in

¹²⁰⁹ Note, 'true ups', referred to in Figure 6.4, allow firms to reconcile the regulated prices with the actual costs that have been incurred by the firm. For example, where the actual costs are not used to establish prices, the regulation can provide for a 'true-up' to the actual costs. This has sometimes been done in the US electricity markets in order to take into account potential stranded costs associated with deregulating markets and opening them up to competitive entry. True-ups to actual costs are sometimes used under price-cap regulation, through a rate of return-sharing mechanism. The use of true-ups typically results in the regulatory regime being more closely aligned with a low-powered incentive-based cost-of-service regulation.

¹²¹⁰ Vogelsang, I., Incentive Regulation and Competition in Public Utility Markets: A 20-Year Perspective, *Journal of Regulatory Economics* 22 Vol. 1, 2002, pp. 5-27. See pp. 7-8.

¹²¹¹ Kwoka, J., Investment Adequacy Under Incentive Regulation, Northwestern University Working Paper, September 2009, Table 1, pp. 25-26.

¹²¹² Boyle, G., Evans, L., and Guthrie, G., Estimating the WACC in a Regulatory Setting, New Zealand Institute for the Study of Competition and Regulation, March 2006, pp. 20-31.

Kwoka to 46. The results in Table H17 indicate that of the 50 US electricity utilities in the sample:

- 24 utilities operated in more than one state;
- 17 utilities are subject only to incentive regulation;
- 12 utilities are not subject to incentive regulation;
- 16 utilities were identified as being under both incentive-based and non-incentive-based regulations as they operated in more than one state;¹²¹³ and
- several utilities could not be classified as they operated in a state that had not been identified as using regulation that was incentive or non-incentive based.

H8.136 This analysis on the regulatory regime faced by US electricity utilities is consistent with the criticism from Boyle et al. that the structure of regulation of the US electricity industry has changed. The majority of the US firms from the comparable firms sample are exposed to some form of incentive based regulation. The results of analysis on the comparative firms sample from the US electricity utilities indicate that there is no difference in the systematic risk between the three identified groups.

H8.137 Even ignoring the potential convergence of the regulatory regimes in the US and UK, empirical analysis by The Allen Consulting Group (ACG), using a 2008 sample of US electricity and gas suppliers' subject to rate-of-return regulation and a sample of firms subject to some form of incentive-based regulation, showed that the group of suppliers with some form of incentive-based regulation had an estimated average equity beta of 0.98, whilst the rate-of-return regulated suppliers had an estimated average equity beta of 1.01. ACG concluded that "we have been unable to find support for the hypothesis that the beta risk of US firms varies materially with the form of regulation".¹²¹⁴

H8.138 With regards to electricity regulation in the UK there appears to have been ongoing developments to mitigate the risks associated with price-cap regulation. Alexander et al. highlighted that in the early 1990s in the UK, price-cap regulation evolved into a form of revenue/price-cap regulation (i.e. hybrid regulation) in order to decrease risk.¹²¹⁵ There are also often provisions made to allow for cost pass-through under the any price or revenue caps.

H8.139 Further, the CEO of Ofgem, Alistair Buchanan as part of Ofgem's RPI@20 project noted that while prices were down, and investment and quality had increased, this had been achieved whilst still decreasing the cost of capital from a pre-tax WACC of 8.5% allowed in 1990 to a rate of just above 6.0% now. He stated that Ofgem

¹²¹³ Of the 50 firms 24 operated electricity distribution services in more than one state. Of the 24, 16 utilities operated in a state that was classified as incentive regulation and in a state that was classified as not incentive regulations. Some utilities that operated in more than one state could not be classified as they operated in a state that was not identified by Kwoka as incentive or non-incentive based.

¹²¹⁴ Allen Consulting Group, *Beta for regulated electricity transmission and distribution - Report for Energy Networks Association, Grid Australia and APIA*, 17 September 2008, pp. 49-50.

¹²¹⁵ Alexander, I, Mayer, C., and Weeds, H. *Regulatory Structure and Risk: An International Comparison*, Policy Research Working Paper 1698, The World Bank, December, 1996.

believed that this low level for the WACC had been secured due to the use of a consistent stable regime, which has still allowed for RPI-X to adapt and accommodate change.¹²¹⁶

- H8.140 In terms of the default/customised price-quality regulatory regime in New Zealand, the Commission considers that it has elements of both a more incentive-based price-cap regulatory regime and a less incentive-based rate-of-return regulatory regime.
- H8.141 The DPP subjects regulated suppliers to a productivity-based price cap, but may not take into account comparative benchmarking analysis, which is often a key feature of incentive-based regulatory regimes used in the UK and Europe. Further, if the regulated supplier considers that it cannot earn a normal rate of return on its investments under this scheme, it can opt to apply to the Commission for a CPP.
- H8.142 The CPP takes into account the supplier's specific circumstances by adopting a building blocks approach and uses forecast information provided by the supplier, which is assessed by the Commission. Taking into account costs of the supplier is typically a feature of less incentive-based forms of regulation, however, the reliance on forecast information that is assessed by the regulator is generally a feature of the incentive-based regimes used in the UK and Australia.
- H8.143 The DPP framework itself also has a number of adjustment mechanisms built into it, such as cost pass-through provisions, which may reduce the supplier's exposure to systematic risk.
- H8.144 As the Commission has determined that transmission pipelines may be subject to a different form of price-cap regulation (subject to meeting the conditions noted below), another related consideration is whether adjustments should be made to the asset betas of any transmission pipeline in New Zealand that faces a different form of regulation to other GPBs.

Gas transmission and gas distribution regulation in New Zealand

- H8.145 The IM Determination provides that in setting the form of control for a gas transmission business the Commission will take into account whether the business manages capacity through contract carriage arrangements and supplies services on the basis of non-standard pricing arrangements (refer to clause 3.1.1(2)). This may result in a gas transmission business being subject to a total revenue cap or a weighted average price cap.
- H8.146 In principle, the Commission considers that while both are a form of price-cap regulation, revenue-cap regulation may result in some mitigation of both systematic and unsystematic risks associated with unanticipated demand shocks. If it has a lower level of systematic risk then it would also have a lower asset beta compared to weighted-average price caps.
- H8.147 In having regard to the regulated services under Part 4, the Commission considers that the systematic risk associated with gas transmission businesses will to a large extent already be low, because of the low elasticity of demand for the services. The Commission further notes that suppliers subject to price-cap regulation can in

¹²¹⁶ Buchanan, A., *Is RPI-X still fit for purpose after 20 years?*, Beesley Lecture, London, 2 October 2008.

practice structure their pricing in such a way to insulate themselves from demand shocks, creating a similar outcome to that which would result under revenue-cap regulation. This can be done through a price capped firm converting tariffs based on usage charges into predominantly tariffs based on fixed charges.

H8.148 Therefore, the question with regard to the effect of revenue-cap regulation is, how much additional systematic risk does the use of revenue-cap regulation actually eliminate?

H8.149 The Commission does not have any robust evidence that demonstrates that these differences in regulatory regimes affect or reduce the level of systematic risk in any material way. This is also the view shared by Vector.¹²¹⁷ In practice, the empirical evidence has not shown a significant difference between the systematic risks associated with different types of regulation.

H8.150 On this basis the Commission considers that if there is any reduction of systematic risk it is likely to be small, and the Commission therefore considers it not appropriate to differentiate the asset beta between regulatory regimes for gas transmission and gas distribution services

Overseas regulators - adjusting for differences in systematic risk due to regulatory differences

H8.151 Australian and UK regulators primarily used data from their own countries, with US and other foreign firms being used as a cross-check only.¹²¹⁸ As such, there was no consideration of whether or not they should adjust for differences in systematic risk due to regulatory differences.

H8.152 The AER did not differentiate the equity beta between the different forms of price-cap regulation. It uses the same asset and equity beta for electricity distribution and electricity transmission, which are subject to different forms of regulation. That is, revenue-cap regulation is in place for electricity transmission¹²¹⁹ and a combination of price and revenue caps are in place for electricity distribution.¹²²⁰

H8.153 As a cross-check the AER evaluated a portfolio of US electricity utilities and compared the results of the equity beta to its estimated equity beta from Australian firms.¹²²¹ The US electricity and gas sample result was 0.71 compared to 0.71 for the highest average of the Australian individual equity betas.

Conclusion - adjusting for differences in systematic risk due to regulatory differences

H8.154 Due to the limited number of relevant listed firms in New Zealand, the Commission has looked to comparable firms listed overseas, which operate under a variety of regulatory regimes to derive a beta estimate.

¹²¹⁷ Vector Limited, *Cross-submission to Commerce Commission on Gas Default Price-Quality Path: Issues Paper*, 31 May 2010, pp. 4-5.

¹²¹⁸ AER, *Final decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009, p. 328.

¹²¹⁹ See p. 132, AER, *State of the Energy Market 2009*, 8 December 2009, Chapter 5, pp. 124-151.

¹²²⁰ See Table 6.2, p. 163, AER, *State of the Energy Market 2009*, 8 December 2009, Chapter 6, pp. 122-189.

¹²²¹ *ibid*, p. 332.

- H8.155 In theory, regulatory regimes can allocate risks between regulated suppliers and consumers differently, such that a regulatory regime can either insulate the regulated supplier from more risk or expose the regulated supplier to more risk. Consequently, the regulatory regime can affect the asset beta that should be set and differences in regulatory regimes should in principle be taken into account.
- H8.156 Previous research suggests that US electricity utilities were subject to less risk than UK electricity utilities and that this was a function of the different regulatory regimes. The Commission notes that the results from research by Buckland and Fraser questions the results of the previous research.
- H8.157 The Commission does not consider that it has any recent empirical evidence that demonstrates different regulatory regimes affect or reduce the level of systematic risk in any material way.¹²²² The empirical evidence considered by the Commission has not shown a significant difference between the systematic risks associated with regulated US and UK entities or for regulated US entities subject to different regulatory regimes.
- H8.158 In part, the current results may reflect that:
- in practice, the difference between the two types of regulation may be minimal;
 - over the past decade there has been a strong movement by US state-based regulators towards more incentive-based forms of regulation; and
 - price-cap regulation has evolved in the UK with new variants of price-cap regulation being introduced, and refinements to RPI-X being made, which have been designed to mitigate risk.
- H8.159 In terms of the default/customised price-quality regulatory regime in New Zealand, the Commission considers that the level of risk it exposes businesses to is comparable to that observed in overseas regimes. New Zealand's incentive-based price-cap regulatory regime is similar to those used overseas, but the New Zealand arrangements include an option for a business to apply for a review during the regulatory period (i.e. the ability to apply for a CPP) which is similar in many ways to arrangements under rate-of-return regulation. The option can only be exercised once every three to five years (depending on the regulatory period chosen), and the number of firms that can apply is limited, so the option may be more restrictive than under some rate of return regimes.
- H8.160 The Commission considers that the estimates for the asset betas for the US and UK electricity utilities; the evidence of the convergence between the two regulatory regimes; and the elements of both price-cap and rate-of-return regulation under the default/customised price-quality regime in New Zealand; suggests that in contrast to the Commission's previous approach, there is no need to adjust upwards the current asset beta estimates sourced from overseas to account for regulatory differences.

¹²²² The current empirical evidence does not necessarily appear to support this conclusion with average asset betas for the US estimated being higher than those in the UK.

- H8.161 Therefore, for EDBs, GPBs and Transpower the Commission does not consider it necessary to make an adjustment to the unadjusted asset beta estimate of 0.34 derived from New Zealand and overseas markets for differences in systematic risk due to regulatory differences.
- H8.162 The Commission notes that while under a CPP the firm can opt for a shorter regulatory timeframe of three or four years, rather than five years, and this could in principle decrease its systematic risk, the Commission considers that any such decrease is likely to be small and difficult to quantify. Further, the effect is likely to be most pronounced where the supplier engages in two successive CPPs with three-year regulatory periods (i.e. six years of CPP regulation), and this type of outcome appears unlikely at this stage. Consequently, the Commission considers that given there is only likely to be a small time difference in regulatory periods faced by the regulated supplier, no adjustment should be made here to take shorter periods of price regulation into account.

Step 5(c): Adjusting for differences in systematic risk between services

EDBs

- H8.163 The Commission recognises that, in principle, there could be differences in exposure to systematic risk between services within an industry and between industries, which would justify an adjustment to asset beta estimates.
- H8.164 As outlined above, the Commission estimates an industry-wide asset beta that applies to all EDBs, GPBs and Transpower. As such, a discussion regarding the differences in systematic risk across EDBs, and subsequent adjustment to EDBs', GPBs' and Transpower's asset betas, does not apply.
- H8.165 As also outlined above, the Commission derives its asset beta estimate for EDBs, GPBs and Transpower from overseas integrated electricity utilities asset beta estimates. Therefore, no adjustment for differences between industries is required.

Conclusion - EDBs' and Transpower's final asset beta from step 5

- H8.166 The Commission notes that there is a wide range of estimates. Having considered the above factors and using the previous advice and its own analysis, the Commission arrived at an average asset beta for EDBs and Transpower of 0.34 from its initial analysis and 0.28 from its updated analysis for monthly frequency data. The Commission has settled on an unadjusted asset beta estimate for regulated EDB services and Transpower of 0.34.

GPBs

- H8.167 The Commission recognises that, in principle, there could be differences in exposure to systematic risk between regulated suppliers within an industry and between different industries, which would justify an adjustment to asset beta estimates.
- H8.168 As outlined above, the Commission estimates an industry-wide asset beta that applies to all GPBs and does not distinguish between gas distribution and gas transmission services. As such, a discussion regarding the differences in systematic risk across GPBs, and subsequent adjustment to GPBs' asset betas does not apply.
- H8.169 However, the Commission has in previous gas decisions considered that an upward adjustment should apply for the differences between EDBs and GPBs in New

Zealand. Dr Lally has provided advice to the Commission on the appropriate level of this adjustment.

- H8.170 In advice on the asset beta for the Gas Control Inquiry and Gas Authorisation, Dr Lally outlined several factors that would influence the level of systematic risk—the nature of the product or service; nature of customers; pricing structure; duration of contract prices with suppliers and customers; presence of regulation; degree of monopoly power; presence of growth options; operating leverage; and market weight of the industry on the market proxy.¹²²³
- H8.171 When assessing these factors Dr Lally considered that EDBs and GPBs had similar pricing structures; similar exposure to a ‘regulatory’ threat of price control; operating leverage; and both sectors were small as a proportion of the market index. Dr Lally considered the situation regarding monopoly power was ambiguous.¹²²⁴
- H8.172 However, Dr Lally considered there were significant differences between EDBs and GPBs in relation to growth options, the nature of the product, and the composition of customers. On the basis of these factors Dr Lally highlighted four potential significant differences between EDBs and GPBs on these factors:
- GPBs, unlike EDBs, had significant options to expand their networks and this may raise the asset beta;
 - a large proportion of gas is used as an intermediate product in the petrochemical industry (methanol production). This suggested a higher elasticity of demand for gas, and therefore a higher asset beta for GPBs. However, Dr Lally considered there were two mitigating factors that ensured the overall effect on the asset beta was small. Firstly, methanol was exported, and secondly, as the distance gas was transported to the methanol production facility was relatively short, very little revenue resulted from the transportation of gas for methanol production;
 - a large proportion of gas is used in electricity generation and some of this is used to generate the variable supply rather than the base supply. If the variable supply were substantial then the demand for gas would be more sensitive to macroeconomic shocks than the demand for electricity, and this would result in a higher asset beta. However, Dr Lally considered most of the gas was used by electricity generators that provided base supply rather than variable supply, and this result did not point to a higher asset beta for GPBs; and
 - leaving aside the fact gas was used by the petrochemical industry (30%), Lally highlighted that 64% was used for commercial and industrial use (i.e. electricity generation) and the remaining 6% used by residential customers. As the majority of gas was used by commercial and industrial users, gas

¹²²³ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, paper prepared for the Commerce Commission, 24 November 2004, pp. 34-38; Lally, M., *The weighted average cost of capital for gas pipeline business*, 28 October 2008, pp. 49-53.

¹²²⁴ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, paper prepared for the Commerce Commission, 24 November 2004, pp. 46-48; Lally, M., *The weighted average cost of capital for gas pipeline business*, 28 October 2008, pp. 62-64.

should be regarded as an intermediate product whose demand was driven by the demand of final goods and services. As the demand for goods and services of commercial and industrial users of gas was likely to be more sensitive to macroeconomic shocks than demand for gas (or electricity) by residential customers, this implied a higher asset beta for GPBs compared with EDBs.

H8.173 Taking into account these factors, Dr Lally considered that GPBs warranted a “modestly” higher asset beta than for EDBs in New Zealand, and recommended adding a margin of 0.10 to reflect the greater risk. This was in addition to the increase in the asset beta to reflect differences in regulatory regimes between New Zealand and the US that Dr Lally proposed.

Empirical evidence and other regulators’ views on differences in systematic risk between electricity and gas services

H8.174 In advice to the Commission on gas and electricity Dr Lally has estimated the asset beta from a sample of US gas and electricity utilities.¹²²⁵ The results from the analysis indicate that US gas pipeline services on average appear to be subject to lower systematic risk than US electricity utilities. The Commission’s more recent empirical analysis confirms this finding.

H8.175 In evidence presented to Ofgem, PwC UK showed that there was minimal difference between the Blume adjusted asset betas for international electricity comparators (i.e. a range of 0.22-0.42, with an average of 0.31) and international gas comparators (a range of 0.24-0.46, with an average of 0.31).¹²²⁶ For the unadjusted asset beta analysis the international gas comparators had a lower asset beta (average of 0.15) compared to the international electricity comparators (average of 0.18).

H8.176 The AER in considering electricity distribution and transmission network providers, used an equity beta of 0.80, which combined with a notional level of leverage of 60%, implied an asset beta of 0.32.¹²²⁷ The AER in three other gas distribution access arrangements adopted the same equity beta and notional leverage parameters on the basis that it considered that gas and electricity businesses were close comparators.¹²²⁸ In a 2009 draft decision for the Jemena gas distribution network the AER stated that:¹²²⁹

The AER estimates an equity beta of 0.8 for a benchmark efficient service provider which it has applied in recent draft decisions for the ActewAGL and Country Energy gas distribution access arrangements.

¹²²⁵ Lally, M., *The weighted average cost of capital for gas pipeline businesses*, November 2004, Table 3, p. 44; Lally, M., *The weighted average cost of capital for electricity lines businesses*, September 2005, Table 3, p. 45; Lally, M., *The weighted average cost of capital for gas pipeline businesses*, October 2008, Table 3, p. 59.

¹²²⁶ PricewaterhouseCoopers, *Advice on the cost of capital analysis for DPCR5, Final Report to the Office of Gas and Electricity Markets*, 28 July 2009, pp. 42-49.

¹²²⁷ AER, *Final decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009.

¹²²⁸ AER, *Draft decision Jemena Access arrangement proposal for the NSW gas networks 1 July 2010 - 30 June 2015*, February 2010, p. 125.

¹²²⁹ AER, *Draft decision, ActewAGL distribution access arrangement proposal 1 July 2010 - 30 June 2015*, November 2009, pp. xiv, xxxvii, 62-65, 72; AER, *Draft decision, Country Energy Access arrangement proposal 1 July 2010 - 30 June 2015*, November 2009, pp. xiv, xxxiv, 47-49, 60; AER, *Draft decision Jemena Access arrangement proposal for the NSW gas networks 1 July 2010 - 30 June 2015*, February 2010, pp. 124-131.

Consistent with these draft decisions the AER considers that the empirical evidence presented in the WACC review [2009 review of the WACC parameters for electricity distribution and transmission networks¹²³⁰] contains the best available estimate of the equity beta that would apply to a gas distribution network service provider. Although the WACC review was conducted in an electricity context, gas and electricity businesses are close comparators. Further, the sample set of data used to derive the equity beta is predominantly made up of gas businesses.

H8.177 The Commission notes, however, that in Australia, the QCA has recognised the potential for higher systematic risks to arise from gas distribution services compared with electricity distribution services. In two separate decisions in May 2006, the QCA, when considering the asset beta for gas distribution networks Envestra and Allgas, stated that:¹²³¹

The Authority is of the view that, in many instances, gas is a fuel of choice, while everyone generally connects to electricity. Because it is a fuel of choice, it faces competition from other sources of energy such as electricity and LPG. As such, the Authority accepts that the gas distributors will be subject to a greater level of systematic risk than the electricity distributors and that a higher equity beta is justified.

Conclusion - differences in systematic risk between services

H8.178 The AER appears to consider that GPBs have similar systematic risk to EDBs, and the empirical evidence seems to indicate that international gas utilities either face very similar or slightly lower systematic risks than electricity utilities.

H8.179 The Commission nevertheless accepts that in New Zealand, GPBs may face higher systematic risk than EDBs, due to the considerations highlighted in previous advice provided to the Commission by Dr Lally (and summarised above) in relation to the differences between New Zealand GPBs and EDBs. At present, there is no evidence in New Zealand to suggest that this situation has changed. Therefore, the Commission considers that it is appropriate to apply the upward adjustment of 0.1 used in past decisions to the asset beta estimate, after any other adjustments have been made.

Conclusion - GPBs final asset beta from step 5

H8.180 The Commission notes that there is a wide range of estimates. Having considered the above factors and using the previous advice and its own analysis, the Commission estimates an average monthly asset beta for GPBs of 0.34 (from Steps 1 to 4) from its initial analysis, and 0.28 (0.23 from the sample of gas utilities) for its updated analysis. On balance, the Commission considers that an appropriate asset beta estimate for regulated gas pipeline services before any adjustments are made is 0.34.

H8.181 No adjustment should be made for multi-divisional asset beta estimates or for differences in systematic risk due to regulatory differences. The Commission considers though that GPBs in New Zealand face higher systematic risk than New Zealand EDBs. Therefore, as in previous decisions, an upwards adjustment of 0.1 is

¹²³⁰ AER, Final decision: *Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009.

¹²³¹ QCA, *Revised Access Arrangement for Gas Distribution Networks: Allgas Energy*, May 2006, p. 75; QCA, *Revised Access Arrangement for Gas Distribution Networks: Envestra*, May 2006, p. 106.

applied to reflect this difference in systematic risk between services (EDBs versus GPBs).

H8.182 After Step 5, the asset beta for GPBs is 0.44.

Step 6: Turning the adjusted asset betas into equity betas

H8.183 The final step in estimating the equity beta is to convert the estimated ‘service-wide’ asset beta to an equity beta that can be applied in the CAPM. In making its decision for EDBs, GPBs and Transpower, the Commission has undertaken the conversion process by applying step three (turning equity betas into asset betas) in reverse.

Other possible adjustments - Blume and Vasicek

H8.184 Blume and Vasicek adjustments are designed to reflect equity beta mean reversion tendencies over time. Applying the Blume adjustment implies a belief that the equity beta will trend over time towards the market average equity beta of one. However, this trend says nothing about the tendencies of the asset beta, particularly for a specific regulated service. Applying the Vasicek adjustment implies a prior belief about the true value of the equity beta which, if valid, should be used in the first place (i.e. represents a Bayesian adjustment). Again, this says nothing about the tendencies of the asset beta, particularly for a specific regulated service.

H8.185 Neither the Blume nor the Vasicek adjustment has been applied in any of the Commission’s previous regulatory decisions.

H8.186 Of the Expert Panel, Dr Lally considered Blume and Vasicek adjustments inappropriate as these types of adjustments lead to an upward bias for low beta industries. Dr Lally recommended that the Commission not make Blume adjustments to equity betas; even Vasicek adjustments are undesirable if beta estimates are sought for more than one firm in an industry because it will lead to different estimates for different firms in the same industry.¹²³²

H8.187 Professors Franks and Myers agreed that some form of Blume and Vasicek adjustments to beta estimates may be sensible, “but did not strongly recommend a specific adjustment method”.¹²³³

H8.188 In submissions on the RDG, some submitters considered that the Commission should either apply, or at least maintain an open mind, to using Blume and Vasicek adjustments to beta estimates.¹²³⁴ Unison submitted:¹²³⁵

... but they do not alter the fact that given the current specification of the CAPM returns for low beta companies are higher than predicted by the CAPM. One way to correct for

¹²³² Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, Report prepared for the Commerce Commission, 18 December 2008, p. 27.

¹²³³ *ibid.*

¹²³⁴ Powerco Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: PricewaterhouseCoopers, *Commerce Commission’s Revised Draft Guidelines and aspects of the Input Methodologies Discussion Paper relating to Cost of Capital prepared for Powerco Limited*, 14 August 2009, pp. 26-29; Powerco Limited, *Submission on the Input Methodologies Discussion Paper*, 14 August 2009, p. 30; NZ Airports Association, *Submission on the Revised Draft Guidelines, Attachment: Uniservices, Comments on the Commerce Commission’s Approach to estimate the Cost of Capital*, 2 December 2009, p. 31.

¹²³⁵ Unison, *Post-workshop submission - weighted average cost of capital*, 2 December 2009.

this downward bias would be to employ blume adjusted betas. Blume adjusted betas might not be part of a clean theoretical model, but they more accurately reflect the returns that are actually earned by firms in real world workably competitive markets.

Conclusion - Blume and Vasicek adjustments

H8.189 The Commission considers that the reasons given by submitters for requiring Blume and Vasicek adjustments can be explained by a range of factors other than any tendencies of the asset betas, particularly for a specific service.

H8.190 The IM does not provide for Blume or Vasicek adjustments in determining the cost of capital for regulated suppliers.

Other possible adjustments - Use of long term financing by the sample of comparator companies

H8.191 CEG (for Vector) submitted that as the average original period to maturity of the debt capital of the US entities in the Commission's comparable company sample used to estimate the equity beta is of the order of 17 years, based on a generalised Modigliani-Miller proposition with respect to financing structure and conservation of risk, the equity beta of these entities must reflect this long term certainty of financing.¹²³⁶ Given the assumption of five year re-financing for suppliers in New Zealand, the re-financing risk for the New Zealand suppliers must be greater than for the US entities. Therefore, in CEG's submission, any New Zealand equity beta estimates derived from US equity beta estimates need to be adjusted to reflect the additional re-financing risk.

H8.192 The proposition regarding the conservation of risk, which relies on a number of key assumptions, relates to the sum total of risks. CEG has focused on a single risk associated with debt capital (i.e. the maturity structure of the debt capital). However, debt capital also has other risks associated with it, for example, interest rate risk.¹²³⁷ How interest rate risk on the debt capital itself is handled, for example, a fixed coupon versus an interest rate that is regularly reset, will also affect the distribution of risk between providers of debt capital and equity capital (and thus the impact on the equity beta).

H8.193 In addition, an entity's interest rate risk can be, and generally is, actively managed independent of the issue of the debt capital, via the use of derivatives. The use of derivatives also provides the opportunity to share risk with a party who is neither a provider of debt capital or equity capital.¹²³⁸

H8.194 Therefore, CEG's conclusion that the overall equity beta must be affected does not follow from CEG's observation regarding the maturity structure of the debt capital. To have any basis for arriving at the conclusion that the overall equity beta must be affected, it would be necessary to analyse the range of risks associated with debt capital, and then undertake empirical analysis of the impact that any actual differences for each of these risks would have on the overall US equity beta

¹²³⁶ Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 51-60.

¹²³⁷ Risks may exist for a given debt issue, for example, optionality, currency, indexation, profit participation.

¹²³⁸ Derivatives can be either outright or operate equivalent to a financial insurance policy, for example, a cap or knock in.

estimates relative to the overall New Zealand equity beta estimates. CEG does not offer a methodology by which this exercise could practically be performed nor does CEG offer the Commission its estimate of the overall impact on the equity beta estimates. The Commission is not aware of any methodology which could be used in practice to perform this exercise.

- H8.195 Further, the Commission has adopted an asset beta estimate for EDBs and Transpower that is above the empirical estimates derived from the comparable company sample. In particular, the asset beta has been specified at 0.34 while the empirical estimates were 0.28 (monthly observations) and 0.32 (for weekly observations). Therefore, if any adjustment to the equity beta is required to address the difference in debt maturities, this may already have been offset by the higher asset beta adopted by the Commission.
- H8.196 CEG's analysis assumes that the Commission has only allowed a cost of debt based upon five year re-financing. However, the IM allows a supplier that issues long-term debt, to also claim the term credit spread differential allowance (covering both the term credit spread difference and the execution costs of an interest rate swap) on the longer term debt. That is, the IM already allows for the additional costs of long-term debt (to reduce refinancing risks) and it is therefore appropriate to use the estimates of the asset betas from international firms, as the Commission has done.
- H8.197 CEG (for Vector) further submit that an important reason why regulated utilities issue long term debt is to reduce the risks that equity holders face associated with re-financing. However, the Commission considers that in, regard to an essential service, re-financing risk is not borne just by shareholders, but could also be borne by consumers if the supplier reduces service, maintenance, and investment levels (and potentially also by bondholders).
- H8.198 For these reasons, the Commission does not consider it appropriate to make any adjustment to the equity beta provided in the IM to allow for differences in the debt maturity profiles between regulated suppliers and the sample of comparator companies.

Standard error of the asset beta

- H8.199 Due to the uncertainty associated with the asset beta estimation the Commission has estimated a standard error for the asset beta.
- H8.200 Dr Lally, in Appendix 3 and Appendix 6 of the Gas Authorisation, demonstrates the process to estimate the standard error of the asset beta estimate (this is similar to the approach displayed in Professor Guthrie (for Transpower) who estimated the standard error of approximately 0.11-0.12 for EDBs).¹²³⁹
- H8.201 In his advice on the Gas Authorisation Dr Lally estimated the standard error of the asset beta to be 0.175. This estimate was derived from the standard error of the component parts that made up the overall asset beta for GPBs. That is:

¹²³⁹ Lally, M., *Weighted average cost of capital for gas pipeline businesses*, 28 October 2008, Appendix 3 and Appendix 6, pp. 170-178 and pp. 185-186; Transpower New Zealand Ltd., *Submission on Transpower (Input Methodologies) Draft Reasons Paper and Individual Price-Quality Path*, Attachment: Graeme Guthrie, *Measurement Error and Regulated Firms' Allowed Rates of Return*, 14 August 2010, pp. 8-14.

- i. the standard error of the asset beta estimated from the US comparable firms analysis derived using the process outlined in Appendix 3 of the Gas Authorisation, 0.136 (Steps 1-4);
- ii. standard error of the estimate for the difference in regulatory regimes, 0.126 and standard error for the estimate to reflect lower risk on New Zealand EDBs compared to five-year price capped firms, 0.29 (Step 5(b)); and
- iii. the standard error for the estimate for GPB versus EDB in New Zealand, 0.06 (Step 5(c)).

H8.202 The Commission followed this process to estimate the standard error of the asset beta for EDBs and GPBs in the respective Draft Reasons Papers. In the EDBs Draft Reasons Paper, the Commission estimated a standard error for the asset beta of 0.12 for EDBs/Transpower. This estimate is based on the standard error of the asset beta from the comparable firms sample only (point (i), above) as the Commission does not apply estimates for points (ii), and (iii) therefore a standard error does not apply to the asset beta for EDBs/Transpower for these factors.

H8.203 For GPBs the estimate was based on the result from EDBs and the previous estimate applied by Lally for point (iii). This resulted in a standard error of the asset beta of 0.14 for GPBs.

H8.204 Subsequent to the EDB and GPBs Draft Reasons Papers, the Commission has also estimated the standard error of the asset beta using the enlarged sample, data frequencies, and sampling periods identified in paragraph H8.49. This produced a range of estimates, which are displayed in Figure H11 for each period and overall summaries in Table H20.

Figure H11 Comparable Firms Unadjusted Asset Beta Standard Errors

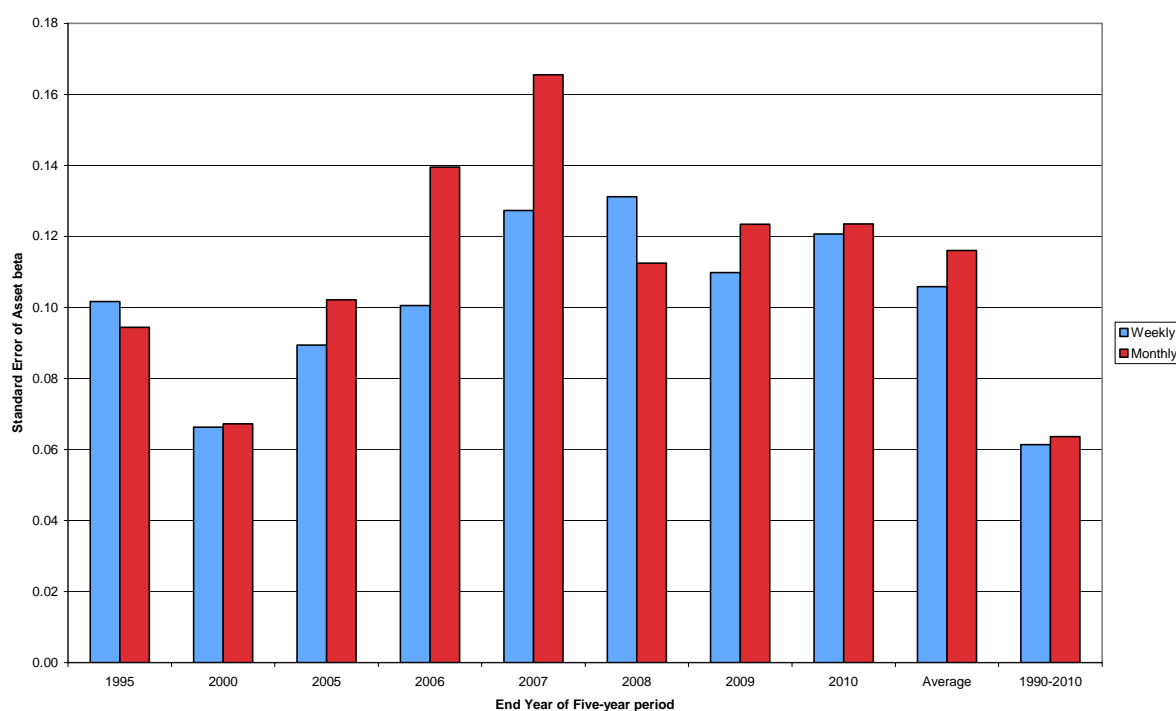


Table H20 Asset Beta Standard Error Summary

	Asset beta standard error estimate	Asset beta standard error range
Monthly all five-year periods	Overall 0.12 Gas 0.09 Electricity 0.12	0.07-0.17 0.03-0.14 0.07-0.17
Weekly all five-year period	Overall 0.11 Gas 0.11 Electricity 0.11	0.07-0.13 0.07-0.16 0.07—0.14
Monthly five-year periods 2005 to 2010	Overall 0.13 Gas 0.10 Electricity 0.13	0.10-0.17 0.05-0.14 0.11-0.17
Weekly five-year periods 2005 to 2010	Overall 0.11 Gas 0.12 Electricity 0.11	0.09-0.13 0.107-0.16 0.09—0.14

Conclusion

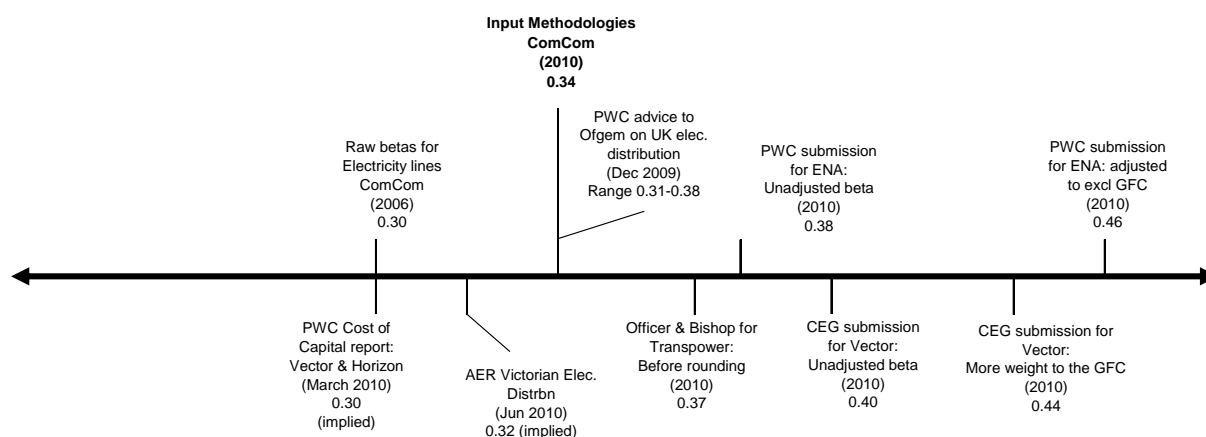
H8.205 Table H20 illustrates the range of estimates for the standard error depending on the period sampled and the frequency. Having particular regard to the estimate of the standard error in the most recent five year period, suggests a standard error for the asset beta of 0.13 for EDBs and Transpower.

H8.206 A higher asset beta has been specified for GPBs, compared to EDBs to reflect the greater perceived riskiness of New Zealand gas pipeline businesses. Consistent with this approach, the standard error of the asset beta for GPBs is set at 0.14, slightly above that for EDBs/Transpower.

Reasonableness checks on the estimated asset beta

H8.207 The Commission has compared the results of its asset beta analysis between services, and across a range of estimates of the asset beta from other sources. This comparison is shown in Figure H12.

Figure H12 Reasonableness Checks on the Asset beta for EDBs and Transpower



- H8.208 Figure H12 shows the Commission's 0.34 estimate of the asset beta for electricity distribution companies falls within the range of comparable information. The Commission also notes that despite the differing approaches to estimating beta, most of the estimates reported above fell within a reasonably tight range, (and with the Commission's estimate in or near the middle of that tight range). This supports the Commission's view that its estimate is a reasonable estimate of the asset beta.
- H8.209 For the gas asset beta, the Commission takes the "raw" asset beta of 0.34 (derived from international estimate of beta for electricity and gas firms) and adds an uplift of 0.10 (to allow for New Zealand specific factors). As there are no pure gas companies listed on the New Zealand market it is not possible to test empirically this estimate of the New Zealand gas asset beta.
- H8.210 The Commission notes that in a recent decision the AER considered "that the best estimate of the equity beta for a gas distribution service provider is between 0.4 and 0.7 taking into account the need to reflect prevailing market conditions, the risks involved in providing reference services and the importance of regulatory certainty."¹²⁴⁰ De-levering this equity beta at the AER's assumed 60% leverage, implies the AER's best estimate of the asset beta lies within the range of 0.16 to 0.28, though to be conservative the AER used an equity beta of 0.80 (an implied asset beta of 0.32). This provides some confidence that the raw asset beta for gas (before the adjustment to reflect greater exposure to systematic risks for New Zealand GPBs) is reasonable (if not generous in favour of suppliers).

Overall conclusion - equity betas

- H8.211 The Commission notes that estimation of the asset beta is not a precise science and produces a range of estimates. The Commission has considered issues raised in submissions on the EDBs, GPBs and Transpower Draft Reasons Papers and has therefore:
- i. set out its practical application of the six-step methodology for estimating the equity beta in detail;
 - ii. increased its sample size and included gas pipeline business;
 - iii. excluded small companies to minimise the risk of bias from thin trading;
 - iv. estimated the asset beta using monthly and weekly data;
 - v. estimated asset betas over a wide range of periods using monthly and weekly data from 1990 to 2010;
 - vi. considered what adjustment may be required to the empirical estimate of the asset beta; and
 - vii. tested the reasonableness of its asset beta against other estimated asset betas.
- H8.212 Having considered the above factors, which include previous advice, decisions and its current analysis, the Commission through using Steps 1-4 has estimated an average asset beta for EDBs, GPBs and Transpower of 0.34.

¹²⁴⁰ AER, *Jemena Gas Networks Access arrangement proposal for the NSW gas networks 1 July 2010 – 30 June 2015*, Final decision, June 2010, p. 173.

- H8.213 On balance, the Commission considers that prior to any potential adjustments being taken into account, 0.34 represents an appropriate unadjusted asset beta, albeit somewhat generous estimate for EDBs, GPBs and Transpower.
- H8.214 Taking into account the potential adjustments to the asset beta (i.e. Step 5), the Commission considers that while no adjustments should be made for regulatory differences between New Zealand and overseas, or between electricity/gas transmission and distribution services, GPBs in New Zealand may face higher systematic risks than EDBs. Therefore, as in the past, an adjustment upwards of 0.1 is appropriate to reflect this difference in systematic risk faced by GPBs. This yields an asset beta of 0.44.
- H8.215 Applying the 6 step approach outlined above for EDBs and Transpower results in an asset beta for EDBs and Transpower of 0.34. Combining this estimate with a notional leverage of 44% equates to an equity beta for EDBs and Transpower of 0.61 with a standard error of 0.13.
- H8.216 Applying the 6 step approach outlined above for GPBs results in an asset beta for GPBs of 0.44. Combining this estimate with a notional leverage of 44% equates to an equity beta for GPBs of 0.79 with a standard error of 0.14.

H9 Debt Beta

Decision - debt beta

H9.1 The IM assumes a debt beta of zero.

Commission's reasons – debt beta

Overview

- H9.2 The debt beta measures a firm's systematic risk associated with borrowing, and is measured by the sensitivity of the returns on corporate debt to movements in returns on the market portfolio of all assets.¹²⁴¹
- H9.3 Debt betas can affect cost of capital estimates in three ways: first, when converting estimated asset betas to equity betas; second, when converting estimated equity betas of comparators into asset betas; and, third, when estimating the firm's cost of debt (in particular, the debt premium).
- H9.4 Whereas considerable attention has been given to investigating the riskiness of common stocks, little empirical work has been done to measure the systematic risk of debt. The Commission recognises that the greater the riskiness of debt the more it resembles equity and therefore the greater the systematic risk of debt due to market conditions, the greater is the debt beta. Therefore, in principle, debt betas should be included in the cost of capital calculation.
- H9.5 The Commission notes that the Expert Panel recommended that the Commission should take account of empirical estimates of debt betas and if debt betas are significant they should be included in the cost of capital estimation.¹²⁴²

¹²⁴¹ In principle, the market portfolio should encompass all assets in the economy, including debt and equity securities, as well as those assets that are traded and untraded.

H9.6 The use of debt betas to address the counter-intuitive relationship between the cost of capital and leverage when applying the simplified Brennan-Lally CAPM was discussed in section H3 (from paragraph H3.46). As noted in that discussion, an assumption of a specific level for the debt beta could remove this anomaly. This feature of the cost of capital when applying the simplified Brennan-Lally CAPM could be viewed as suggesting that in considering what value for the debt beta should be used in the simplified Brennan-Lally CAPM a joint consideration of the empirical estimation of the debt beta and of its interaction with leverage in the simplified Brennan-Lally CAPM would be appropriate. The analysis considered here focuses on:

- i. the prior issue of the empirical estimation of the debt beta;
- ii. the results for the equity beta given a non-zero debt beta; and
- iii. leverage and the results on the cost of capital.

Practical difficulties when estimating the debt beta

H9.7 There are three common approaches to estimating the debt beta:

- i. estimate the debt beta using the structure of the CAPM (i.e. the systematic risk component of all outstanding debt with the same maturity, tenor and credit rating characteristics as the companies debt;
- ii. consider the systematic risk component of the company's debt; and
- iii. assume that the debt beta is either zero or a positive non-zero point estimate.

H9.8 Using the CAPM based approach (approach i) debt betas can be estimated using a portfolio of traded corporate bonds aggregated by rating class and by maturity, and regressing the returns to this portfolio, against the returns of the overall market portfolio. The coefficient on the market factor would be the estimated beta for that risk and maturity class of bonds.

H9.9 However, even the portfolio approach, which pools together information from several traded debt instruments, can be difficult to implement for small, thinly-traded markets such as New Zealand. Paucity of data can be a major hindrance to obtaining reasonably precise debt beta estimates.

H9.10 In their submission for NZAA, LECG stated that, in practice, it would be very difficult to obtain a market estimate of the debt beta, especially when, as in New Zealand, there are few frequently traded debt securities on issue.¹²⁴³

H9.11 Dr Lally advised the Commission that using a debt beta that flattened the line entirely may be inappropriate as not all of the debt premium is entirely due to systematic risk.¹²⁴⁴

¹²⁴² Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, December 2008, pp. 23-24.

¹²⁴³ LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report on behalf of NZAA, 31 July 2009, p. 27.

¹²⁴⁴ Lally, M., *WACC and Leverage*, Report to the Commerce Commission, 17 November 2009.

- H9.12 With regard to estimating equity betas, the Commission noted that these would be inherently imprecise and involve a significant degree of judgement. Given the difficulty associated with obtaining reliable data for a portfolio of traded corporate bonds, the Commission considers that the estimation of debt betas would be even more imprecise and require an even greater degree of judgement.
- H9.13 An indirect method to estimate the debt beta involves decomposing the observed cost of debt into a number of smaller components to leave an estimate of the premium that lenders require as compensation for bearing systematic risk (approach ii).¹²⁴⁵ The debt beta estimate would be decomposed using the following formula:
- $$\begin{aligned} \text{Debt premium} &= \text{liquidity premium} + \text{default premium} + \text{systematic risk premium} \\ &= \text{liquidity premium} + \text{default premium} + \beta_d \cdot \text{MRP} \end{aligned}$$
- H9.14 This method involves a significant degree of judgement as it would require the Commission to attribute values to each of the parameters used.
- H9.15 The third approach, to assume a positive value for the debt beta, that would make the cost of capital invariant to leverage, would also require a significant degree of judgement from the Commission. As the Commission's debt premium is based on promised yields the estimate of the debt beta would need to reflect that not all of the risk associated with the debt margin is systematic.
- H9.16 Dr Lally advised the Commission that even if the debt beta were estimated to accurately capture the true systematic risk component of the debt premium, the cost of capital/leverage relationship might still be positive. This was because there was a liquidity premium for corporate debt (for which there is no counterpart in the cost of equity) and debt incurs bankruptcy costs which increase as leverage does (but again equity does not incur such costs). Furthermore, Dr Lally recommended that if debt betas were used the Commission should define the cost of debt as the expected yield (not the promised yield) plus an allowance for bankruptcy costs. As he noted, this is not easy. Dr Lally does not address whether the liquidity premium and bankruptcy costs factors are likely to be significant in practice (at moderate levels of leverage).¹²⁴⁶
- H9.17 The Commission notes that the majority of Australian and UK regulators apply a debt beta of zero in regulatory determinations.
- H9.18 In Australia, the Queensland Competition Authority (QCA) has consistently applied a positive debt beta. The QCA applies a mid-point debt beta value of approximately 0.1 as it considers that the historical debt beta estimate of 0.2, using the CAPM method, would overstate the estimate of systematic risk.¹²⁴⁷

¹²⁴⁵ The debt margin a borrower is required to pay primarily reflects three types of risk. These are default premium (credit risk of the borrower), liquidity premium (compared to government bonds) and uncertainty premium (compensation for lack of diversification).

¹²⁴⁶ Lally, M., *WACC and Leverage*, Report to the Commerce Commission, 17 November 2009.

¹²⁴⁷ For decisions relating to the use of debt betas see Queensland Competition Authority, *Gladstone Area Water Board: Investigation of Pricing Practices*, Final report, June 2010 and Queensland Competition Authority, *QR Network's 2010 DAU - Tariffs and Schedule F, Draft Decision*, June 2010.

- H9.19 The UK Competition Commission applied the second approach in the assessment of the appropriate debt beta to be used in both its decisions on the price reviews of Heathrow/Gatwick in 2007 and Stansted in 2008.¹²⁴⁸ This approach resulted in a range for the debt beta of 0.09 to 0.19 in 2007 and 0.10 to 0.22 in 2008. The UK Competition Commission considered that the appropriate point estimate of the debt beta was 0.10 in both decisions.
- H9.20 The majority of submissions considered that the estimation of debt betas for New Zealand firms is problematic and probably not feasible at present and preferred that the Commission set debt betas to zero.¹²⁴⁹

A non-zero debt beta

- H9.21 BARNZ noted that the Commission described 0.1 as a conservative estimate of the debt beta; therefore adopting an estimate of zero is extremely conservative and highly favourable to the regulated suppliers.¹²⁵⁰
- H9.22 In a submission on the EDBs Draft Reasons Paper, Officer and Bishop (for Transpower) considered the assumption that the beta of BBB+ debt was zero was unrealistic. Officer and Bishop proposed a debt beta of 0.2.¹²⁵¹
- H9.23 A debt beta of 0.2 is consistent with the debt beta recommendation of UK CAA to the UK Competition Commission in the assessment of the cost of capital for Heathrow and Gatwick airports in 2007.¹²⁵² However, as discussed above, the UK Competition Commission used a debt beta of 0.1.¹²⁵³
- H9.24 The Commission recognises that the greater the riskiness of debt the more it resembles equity and therefore the greater the systematic risk of debt due to market conditions, the greater is the debt beta. Therefore, in principle, debt betas should be included in the cost of capital calculation.

Overall Conclusion - debt beta

- H9.25 In principle, the Commission considers the use of non-zero debt betas as conceptually sound. Debt premiums do have an exposure to systematic risk, and the use of non-zero debt betas this addresses the anomaly that post-tax WACC can increase with leverage. That is, non-zero debt betas makes the post-tax WACC estimate for an individual service less variant or invariant to leverage.

¹²⁴⁸ UK Competition Commission, *A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd)*, Appendix F - Cost of Capital, pp. F21-F26, 28 September 2007; UK Competition Commission, *Stansted Airport Ltd - Q5 price control review*, 23 October 2008, Appendix L, pp. L33-L35.

¹²⁴⁹ References to submissions on debt betas are noted in paragraph H3.47.

¹²⁵⁰ Board of Airline Representatives New Zealand Inc, *Submission on Commerce Commission Input Methodologies (Airport Services) Draft Reasons Paper and Draft Determination*, 12 July 2010, p. 18.

¹²⁵¹ Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Officer R. and Bishop S., *Independent Review of Commerce Commission WACC proposals for Transpower*, 5 August 2010, pp. 22-24 and p. 37.

¹²⁵² UK Competition Commission (UK), *A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd)*, Appendix F - Cost of Capital, paragraphs 88-90, 28 September 2007, Table 1, p. F6.

¹²⁵³ UK Competition Commission (UK), *A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd)*, Appendix F - Cost of Capital, paragraphs 88-90, 28 September 2007, pp. F24-26.

- H9.26 However, there are practical difficulties in accurately estimating the debt beta, though these are offset by the regulatory precedents noted offshore for the use and level of non-zero debt betas.
- H9.27 For the reasons set out in the Leverage section (see paragraphs H3.46 to H3.64), the Commission has assumed a zero debt beta in the cost of capital IM.

H10 Taxation

Decision - taxation

- H10.1 The Commission's decision is that the corporate tax rate used in calculating the cost of capital should mirror the statutory tax rates. This will be 30% until the regulatory period that starts on or after 1 April 2011 when the corporate tax rate will be 28% (until any change in the statutory corporate tax rate).
- H10.2 The investor tax rate has been set to reflect the maximum prescribed investor rate under the PIE regime. The PIE regime enables individuals to limit tax liability on interest to a maximum of 30% until 30 September 2010, and 28% from 1 October 2010 (until any change to the maximum tax rate applicable to the PIE regime). Those rates are therefore used in determining the investor tax rate.
- H10.3 The IM Determination allows for any future changes in tax rates to flow through to the calculation of the cost of capital.
- H10.4 No account is taken of individual tax circumstances (accumulated tax losses, inability to use imputation credits) as the cost of capital under Part 4 must be consistent with outcomes in workably competitive markets. As discussed in paragraphs 6.2.2 - 6.2.7, this means the relevant cost of capital is that of an efficient industry cost of capital, rather than the cost of capital which reflects the tax situation of individual suppliers or investors.

Commission's reasons – corporate tax rate

- H10.5 The corporate tax rate is the statutory tax rate for business entities set by the New Zealand government. The corporate tax rate enters the cost of capital estimation when estimating a post-tax cost of capital.
- H10.6 The statutory corporate tax rate is 30% until the regulatory period that starts on or after 1 April 2011 when the corporate tax rate will be 28%. The Commission's decision is to therefore adopt these rates when estimating the cost of capital.
- H10.7 A provision has been added to the IM Determinations that links the corporate tax rate to the statutory tax rate, thereby allowing for future possible corporate/statutory tax rate changes.

Commission's reasons – investor tax rate

- H10.8 The investor tax rate is the average personal tax rate across all investors in the economy. It enters the cost of capital estimation (as t_i) in the simplified Brennan-Lally version of the CAPM.

H10.9 This adjustment to the classical CAPM is incorporated to reflect the fact that the New Zealand tax regime permits the use of imputation tax credits (attached to dividend payments) to offset personal tax obligations and the fact that most investors are exempt from tax on capital gains, with the result that equity returns are essentially tax free whilst interest income is not.

Determining the investor tax rate

H10.10 The Commission considers that an assumed investor tax rate of 30% until 30 September 2011 and reduced to 28% thereafter recognises that whilst there are a range of statutory tax rates for interest earned by individuals, depending upon their respective total taxable income, the utilisation of the Portfolio Investment Entity ('PIE') regime effectively enables individuals to limit their tax liability on interest earned to a maximum of 30% until 30 September 2010 and this has been reduced to 28% from 1 October 2010.¹²⁵⁴ The Commission's decision is to lower the investor tax rate from 1 October 2011.

H10.11 A provision has been added to the Determinations which will allow for changes in the investor tax rate for future possible changes to the PIE regime on an ongoing basis.

H10.12 In a regulatory period that straddles 1 October 2010 the investor tax rate will be applied as a blended rate incorporating the proportion of the regulatory year the investor tax rate was at 30% and the proportion of the regulatory year that the investor tax rate was at 28%.

H10.13 Whilst applying the figures of 30% until 30 September 2010 and 28% from 1 October 2010 would not be reflective of the true position for all investors in suppliers of regulated services under Part 4, the Commission has previously noted that the effect of any difference is likely to be relatively small.

Conclusion - investor tax rate

H10.14 The Commission recognises that whilst there is a range of statutory tax rates for interest earned by individuals, depending upon their respective total taxable income, the utilisation of the PIE regime effectively enables individuals to limit their tax liability on interest earned to a maximum of 30% until 30 September 2010 and 28% thereafter. The Commission concludes that the reduction of the top marginal tax rate from 38% to 33% does not change the logic that has been applied in arriving at the estimates for the investor tax rates, as investors can continue to shelter income at the PIE rate.

H10.15 The Commission notes that, while there is some uncertainty as to what the true average investor tax is, this uncertainty has little effect on suppliers' cost of capital as a small difference in this tax rate is likely to be immaterial to the final allowed rate of return.

H10.16 Therefore, the Commission will use an investor tax rate of 30% until 30 September 2010. This estimate has been reduced to 28% from 1 October 2010.

¹²⁵⁴ A PIE is a type of entity, such as a managed fund that invests the contributions from investors in different types of investments. For more information on PIE see New Zealand IRD at <http://www.ird.govt.nz/toii/pie/companies/about/pie-investors-companies-about.html>.

H10.17 A provision has been added to the Determinations which will allow for changes in the investor tax rate for future possible changes to the PIE regime on an ongoing basis.

H11 The Cost of Capital Range

Decision - the cost of capital range

H11.1 The IM estimates a cost of capital range by estimating and combining individual parameters' standard error.

H11.2 For the EDBs, Transpower and GPBs, for information disclosure, the Commission considers it appropriate to take a range between the 25th to 75th percentiles.

H11.3 For the purposes of default/customised price-quality regulation for EDBs and GPBs, and the Individual Price Path for Transpower, the 75th percentile estimate of the cost of capital is to be applied.

Commission's reasons - the cost of capital range

H11.4 The cost of capital must be estimated as it cannot be observed directly. This raises the prospect of error since it is not possible to know the true cost of capital. The Commission has to make a judgement call as to how the IM should address the consequences of potential error.

H11.5 Typically, the Commission is faced with uncertainty when it estimates the cost of capital. These uncertainties include, for example, choice of the models to estimate and the statistical error surrounding individual parameter estimates.

H11.6 Model error relates to the choice of a particular model used in the estimation, while parameter error is the error between the (unknown) best approximation and the true value of a parameter estimate. These two errors are closely related especially in trying to estimate the true cost of capital when it is unknown. That is, both relate to the difficulty in estimating the true cost of capital when one cannot observe the true cost of capital, or its components.

H11.7 The IM accounts for uncertainties in parameter estimates by deriving a plausible range for the cost of capital (rather than a single point estimate) that reflects the possible spread between estimated and true parameter values underlying the cost of capital. Selecting an appropriate point estimate within this range for application under each regulatory instrument will then depend on the particular regulatory instrument under which the cost of capital is applied (i.e. information disclosure, DPP, CPP, and IPP). The Commission has also considered the potential for model error when undertaking its reasonableness tests in section H 13. The Commission concludes that the IM estimates of the cost of capital are reasonable and commercially realistic.

H11.8 The Commission must make an allowance for the potential errors that are reasonable in the particular circumstance in which the cost of capital is to be used, but without producing a range that is so broad as to be meaningless and of no practical use in assessing profitability or determining price-quality paths.

Estimating the cost of capital range - four possible approaches

- H11.9 In principle, there are two approaches that can be used to estimate the cost of capital range: an analytical approach and a simulation approach. Each of these can be relatively simple or relatively complex (when compared to each other), bringing the total number of approaches to four. These are defined below as the simple analytical approach, complex analytical approach, simple simulation approach and complex analytical approach.
- H11.10 Each of the four approaches starts by grouping the underlying cost of capital parameters (i.e. the risk-free rate, debt premium, leverage, asset betas, TAMRP, and corporate and investor tax rates) into those that have and those that do not have significant uncertainty associated with them.
- H11.11 The parameters that the Commission considers may have significant uncertainty associated with them are the asset beta, debt premium, and the TAMRP. This is because the Commission considers the procedures that are required to estimate these parameters are more complex due to the variability of the data needed to estimate them compared to the other relevant parameters. For this reason, these parameter estimates are likely to be subject to a significantly larger degree of variability than the other parameters, and this variability needs to be accounted for when estimating the cost of capital.
- H11.12 In contrast, the risk-free rate, leverage, and corporate and investor tax rates do not have the same degree of uncertainty associated with them. This is because they are either: (i) readily observable such as the corporate tax rate; (ii) relatively simple to estimate such as the risk-free rate; or (iii) take an assumed value that is fixed such as 'notional' leverage.

The 'simple analytical approach'

- H11.13 The simple analytical approach would require the IM to determine an upper and lower bound alike for each of those parameters that the IM considers has uncertainty associated with it. These bounds are determined based on qualitative judgement.
- H11.14 The next step is to estimate the cost of capital using only the upper bound values of the underlying parameters and then to estimate the cost of capital using only the lower bound values. The resulting cost of capital estimates are then the upper and lower bound of the cost of capital range.
- H11.15 The advantages of the simple analytical approach to estimate the cost of capital range are that it is readily understandable, intuitive and easy to replicate.
- H11.16 The main disadvantages of this approach are that:
- i. it relies on judgement when determining the upper and lower bounds of individual parameters;
 - ii. it does not make use of some statistical information that is readily available and that could be used to provide some guidance regarding the extent of uncertainty surrounding parameter estimates;
 - iii. the underlying assumption of parameters being uniformly distributed is unrealistic; and

- iv. it expands the range associated with the cost of capital estimate, and thus may not appropriately account for the uncertainty that underlies the estimates.

H11.17 The simple analytical approach is the approach used by UK regulators, e.g. Ofgem.

The 'complex analytical approach'

H11.18 The complex analytical approach can be broken down into the following steps:

- use the estimates of all parameters to derive an overall cost of capital estimate;
- group the cost of capital parameters into those that have and those that do not have significant uncertainty associated with them;
- estimate a statistical measure of the uncertainty for each parameter that the Commission considers has significant uncertainty associated with it (this measure is called the standard error and can be estimated using the parameter estimates' underlying data);¹²⁵⁵
- combine these standard errors to derive an overall level of uncertainty for the cost of capital estimate; and
- derive a cost of capital range, at a given percentile, by applying the overall estimate of uncertainty to the estimated cost of capital.

H11.19 The standard error of the post-tax cost of capital is estimated using the following formula:¹²⁵⁶

$$\sqrt{\text{var}(TAMRP)\text{var}(\hat{B}_a) + E^2(TAMRP)\text{var}(\hat{B}_a) + E^2(\hat{B}_a)\text{var}(TAMRP) + (1 - T_c)^2 [\text{var}(\hat{p})\text{var}(\hat{L}) + E^2(\hat{p})\text{var}(\hat{L}) + E^2(\hat{L})\text{var}(\hat{p})]}$$

¹²⁵⁵ The standard error of a sample, denoted by s_n is defined as follows:

$$s_n = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}$$

where:

N is the number of sample observations;

x_i are the observed values of the sample items; and

\bar{x} is the mean value of these observations.

¹²⁵⁶ For a detailed description of the process to derive the standard error of the cost of capital from the individual parameter standard errors see Lally, M., *The weighted average cost of capital for gas pipeline businesses*, 28 October 2008, Appendix 6.

where:

$\text{var}(T\hat{A}\hat{M}R\hat{P})$ is the square of the standard error of the estimated tax-adjusted market risk premium;

$E^2(T\hat{A}\hat{M}R\hat{P})$ is the square of the estimated tax-adjusted market risk premium;

$\text{var}(\hat{B}_a)$ is the square of the standard error of the asset beta;

$E^2(\hat{B}_a)$ is the square of the estimated asset beta;

T_c is the corporate tax rate;

$\text{var}(\hat{p})$ is the square of the standard error of the debt premium;

$E^2(\hat{p})$ is the square of the estimated debt premium;

$\text{var}(\hat{L})$ is the square of the standard error of leverage; and

$E^2(\hat{L})$ is the square of leverage.

- H11.20 For the purpose of the formula for determining the standard error of the cost of capital, it is assumed that the parameters are uncorrelated to each other and are normally distributed.
- H11.21 The advantages of the complex analytical approach are: (i) that it makes greater use of statistical information regarding the level of uncertainty of individual parameter estimates; and (ii) that it is transparent and still easy to replicate.¹²⁵⁷
- H11.22 The main disadvantages of this approach are that, although greater use is made of statistical information, the use of such information might create a sense of precision that is not warranted. Also, some degree of judgment is still involved when applying this approach. Finally, the assumption of the overall cost of capital estimate being normally distributed is unlikely to be satisfied in reality.
- H11.23 This is the approach favoured by the Commission in recent energy related decisions, e.g. Gas Authorisation and Electricity Control Inquiry of Unison.

¹²⁵⁷ Professor Guthrie (for Transpower) notes this point submitting that:

... I appreciate that use of a mathematical formula has transparency benefits that may offset some of its disadvantages. In particular, a much wider range of interested parties will be able to test the impact of parameter assumptions on the level of the increment using a published formula than using a Monte Carlo simulation.

See Transpower Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Guthrie G., *Measurement Error and Regulated Firms' Allowed Rates of Return: a report prepared for Transpower New Zealand Limited*, 14 August 2010, p. 22.

Simulation approach

H11.24 Under a simulation approach, for each parameter that the IM considers has uncertainty associated with it, the Commission would randomly select a large number of values drawn from a distribution with the same underlying statistical properties (in terms of mean and standard error) as the parameter itself. A simulation approach may have the ability to be as simple or complex as required. An example of this approach is the Monte Carlo method.¹²⁵⁸

The 'simple simulation approach'

H11.25 The IM's parameter estimates and standard errors are to be combined to generate a large number of random cost of capital estimates. The statistical properties of this random sample of cost of capital estimates can then be used to derive an overall measure of uncertainty of that estimate, which in turn informs the cost of capital range at any given percentile.

H11.26 Similar to the complex analytical approach, the simple simulation approach assumes that the underlying cost of capital parameters are not correlated.

H11.27 A simulation approach is particularly useful for models, where the parameters are related in a complex fashion due to feedback loops or correlations. In such a case, it might not be feasible to derive an analytical solution to the problem.

H11.28 The main disadvantage of the simple simulation approach is that it is more complex to implement than analytical approaches. More importantly, in the current context where an analytical approach is feasible, the two approaches result in the same outcomes as they are subject to the same assumptions. In this case, the simple simulation approach adds unnecessary complication while adding no significant benefit.

The 'complex simulation approach'

H11.29 The difference between the simple and complex simulation approach is that the latter relaxes the assumptions on the distribution and correlations of the underlying cost of capital parameters.

H11.30 The advantage of the complex simulation approach is that it relaxes some of the restrictive assumptions of the previous approaches. However, this is, at the same time, a disadvantage as relaxing those assumptions would add a significant degree of complexity.

H11.31 The Commission is not aware of any UK or Australian regulator that uses a Monte Carlo or other simulation approach.

Expert advice

H11.32 The Expert Panel agreed with using the approach described as the complex analytical approach of estimating standard errors for each variable underlying the cost of capital. Further, Professor Myers and Dr Lally consider that there would be no significant additional benefit to the Commission (over the complex analytical

¹²⁵⁸ Monte Carlo method is a technique used to estimate the probability distribution of a random variable. Monte Carlo simulates the results of a model or process by accumulating average results of thousands of random draws from the probability distributions of input variables. Monte Carlo simulation can accommodate complex stochastic process.

approach) in employing a simulation approach to estimate cost of capital distributions.¹²⁵⁹

Submissions

H11.33 In submissions on the RDG and IMs parties either explicitly or implicitly agreed with the Commission's view to specify a range of possible cost of capital values.¹²⁶⁰

H11.34 However, a wide variety of submissions were made on the Commission's choice of approach to estimating a range. The views regarding how to arrive at such a range varied widely among submitters with some favouring the simple analytical approach,¹²⁶¹ some favoured the complex analytical approach,¹²⁶² while others favoured the complex simulation approach.¹²⁶³

¹²⁵⁹ Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology, Report prepared for the Commerce Commission*, 18 December 2008, pp. 34-35.

¹²⁶⁰ Aurora Energy Limited, *Submission to the Commerce Commission on its Discussion paper on Input Methodologies*, 14 August 2009, p. 6; Unison Networks Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: Castalia Strategic Advisors, *Submission on Input Methodologies: Regulatory Cost of Capital: a report prepared for Unison Limited*, 13 August 2009, pp. 7-9; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report on behalf of ENA, 11 August 2009, pp. 7-12; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report for NZAA, 31 July 2009, pp. 23-26; Christchurch International Airport Limited, *Submission on Commerce Commission Input Methodologies Discussion Paper*, 7 August 2009, p. 27; Christchurch International Airport Limited, *Submission on the Revised Draft Cost of Capital Guidelines*, 3 August 2009, pp. 3-4; Orion, *Submission on Input Methodologies Discussion Paper*, 14 August 2009, p. 29; Powerco Limited, *Input Methodologies Discussion Paper*, 14 August 2009, p. 32 Powerco Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: PricewaterhouseCoopers, *Commerce Commission's Revised Draft Guidelines and aspects of the Input Methodologies Discussion Paper relating to Cost of Capital prepared for Powerco Limited*, 14 August 2009, p. 36; PricewaterhouseCooper, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, pp. 14-15; PricewaterhouseCoopers, *Submission on the Input Methodologies Discussion Paper*, Report prepared for 19 EDBs, 14 August 2009, p.39; Telecom, *Annex B: Submission on Commerce Commission Revised Draft Guidelines for estimating the Cost of Capital*, August 2009; Vector Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: Vector Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: Synergies Economic Consulting, *Initial Weighted Average Cost of Capital Review: prepared for Vector Limited*, 14 August 2009, pp. 44-45; Vector, *Submission to Commerce Commission on Input Methodologies Discussion Paper*, 14 August 2009, p. 92, Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: LECG, *Response to Commerce Commission's Draft Cost of Capital Input Methodology: a report prepared for the Electricity Networks Association*, 13 August 2010, pp. 15-16; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, p. 19, Telecom Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010; Telecom, *Submission on Input Methodology Draft Reasons Papers*, Comments by Graeme Guthrie, 12 August 2010, pp. 11-13; KPMG, *Cross-Submission on GPBs (Input Methodology) Draft Reasons Paper, Cost of Capital*, 13 August 2010. pp. 9-12; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, p. 56.

¹²⁶¹ Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: LECG, *Response to Commerce Commission's Draft Cost of Capital Input Methodology: a report prepared for the Electricity Networks Association*, 13 August 2010, pp. 15-16; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, p. 19.

¹²⁶² At the cost of capital workshop and in further consultation the following parties agreed with the Commission's approach to estimating the range (complex analytical approach) - Dr Layton (NZIER advising BARNZ), Mr Hoogland (Transpower), Mr Balchin (PwC advising Powerco), Mr Redmayne (PwC advising 17 EDBs and Telecom), Mr Best (Saha advising AECT), Mr Shelly (CRA advising Unison), Mr Carvell (Vector) and Mr Goodeve (Powerco). See

- H11.35 Some submissions criticised the Commission's approach as implying greater precision than was possible in practice.¹²⁶⁴
- H11.36 A number of submitters argued that the Commission should utilise the Monte Carlo simulation instead of, or as a cross-check to, its present complex analytical approach when developing cost of capital ranges. They considered that if different distribution types and/or partial correlations were assumed for different parameters, then Monte Carlo would (in many cases) be simpler to apply than trying to analytically derive the distribution function for the resulting cost of capital.¹²⁶⁵
- H11.37 In short, there was no consensus on what a better methodology for establishing a range would be. The Expert Panel generally supported the Commission's statistical approach and considered there would be no significant additional benefit by the

Commerce Commission, *Cost of Capital Workshop Transcript*, pp. 206-226; Auckland Energy Consumer Trust, *Cross Submission to the Commerce Commission on Cost of Capital Workshop*, 2 December 2009, p. 27; Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital*, Report on Behalf of NZAA, 2 December 2009, pp. 73-74; Vector Limited, *Post-Workshop Submission on the Cost of Capital*, Attachment: Synergies Economic Consulting, *Cost of Capital Cross Submission*, 2 December 2009, pp. 16-18; Vector, *Cross Submission to the Commerce Commission on the Weighted Average Cost of capital Workshop*, 2 December 2009, pp. 20-23; Major Electricity Users' Group, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, Appendix.

¹²⁶³ LECG, *Comments on the Commerce Commission's Proposed Approach to Estimating the Cost of Capital*, Report on behalf of ENA, July 2009, p. 8; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report for NZAA, 31 July 2009, pp. 23-26; PricewaterhouseCoopers, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, pp. 14-15; Unison, *Appendix: Submission on Revised Draft Guidelines: The Commerce Commission's Approach to Estimating the Cost of Capital*, 14 August 2009, p. 9; Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital*, Report on Behalf of NZAA, 2 December 2009, pp. 73-74; Telecom Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010; Telecom, *Submission on Input Methodology Draft Reasons Papers*, Comments by Graeme Guthrie, 12 August 2010, pp. 11-13; KPMG, *Cross-Submission on GPBs (Input Methodology) Draft Reasons Paper, Cost of Capital*, 13 August 2010, pp. 9-12; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, p. 56.

¹²⁶⁴ LECG, *Comments on the Commerce Commission's Proposed Approach to Estimating the Cost of Capital*, Report on behalf of ENA, July 2009, p. 8; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report for NZAA, 31 July 2009, pp. 23-26; PricewaterhouseCoopers, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, pp. 14-15; Unison, *Appendix: Submission on Revised Draft Guidelines: The Commerce Commission's Approach to Estimating the Cost of Capital*, 14 August 2009, p. 9.

¹²⁶⁵ LECG, 2009, *Comments on the Commerce Commission's Proposed Approach to Estimating the Cost of Capital*, Report on behalf of ENA, p. 8; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report for NZAA, 31 July 2009, pp. 23-26; PricewaterhouseCoopers, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, pp. 14-15; Unison, *Appendix: Submission on Revised Draft Guidelines: The Commerce Commission's Approach to Estimating the Cost of Capital*, 14 August 2009, p. 9; Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital*, Report on Behalf of NZAA, 2 December 2009, pp. 73-74; Telecom Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010; Telecom, *Submission on Input Methodology Draft Reasons Papers*, Comments by Graeme Guthrie, 12 August 2010, pp. 11-13; KPMG, *Cross-Submission on GPBs (Input Methodology) Draft Reasons Paper, Cost of Capital*, 13 August 2010, pp. 9-12; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on Cost of Capital Material In the Commerce Commission's Draft Input Methodologies Determination and Reasons Paper: a report prepared for Telecom New Zealand Limited*, 13 August 2010, p. 56.

Commission employing Monte Carlo simulation techniques to estimate the cost of capital.

Conclusion - calculating the cost of capital range

H11.38 As evidenced by the diversity of approaches favoured by submissions, it is a matter of judgement as to which approach is best. For the purpose of IMs, the decision is to estimate the cost of capital range using the complex analytical approach where it estimates and combines individual parameters' standard error (i.e. their level of uncertainty) into a plausible cost of capital range.

H11.39 This approach involves less judgement than the simple analytical approach, makes greater use of statistical information to guide the IM's decision, is more transparent and can be replicated by interested parties.

H11.40 The Commission considers that a simple simulation approach would add no significant gains for the purpose of estimating the cost of capital. Simulation techniques are typically used to evaluate a system in which variables interact in a complex manner, due to feedback loops or correlations, and therefore obtaining an analytical solution to the system is not feasible. This is not the case when estimating the cost of capital.

H11.41 The Commission does not see any feedback loops or significant correlations in the interaction between costs of capital variables that warrant the use of simulation techniques; nor have any submitters provided persuasive evidence on this point. The Commission considers that it is feasible to obtain direct estimates and reasonable ranges for the cost of capital without simulation techniques; employing such techniques would add unnecessary complexity and less transparency to the estimation process without offering significant additional benefit.

Applying the 'complex analytical approach'

H11.42 Details of the IM's proposed approach for estimating the cost of capital range in the context of Part 4 of the Act are set out in, for example, Lally (2008, Appendix 6; pp. 92–93). Broadly, the approach involves the following steps:

- i. Estimate each of the individual cost of capital parameters and their associated standard errors using the procedures discussed above. In some cases the standard errors will be readily available (e.g. if the parameters have been econometrically estimated); in other instances, the Commission must rely on qualitative judgement to specify plausible values.¹²⁶⁶
- ii. Combine each of the point estimates for the individual parameters using the relevant cost of capital equation (e.g. pre-tax, post-tax or vanilla cost of capital depending on circumstances) to obtain an overall cost of capital estimate (the so-called 'midpoint' of the cost of capital range).
- iii. Make some reasonable assumptions about the degree of correlation between the individual cost of capital parameters.

¹²⁶⁶ Sometimes, even when statistically-estimated standard errors are available, in order to account for any uncertainties (e.g. model uncertainty) that cannot readily be quantified, it may be desirable to augment or attenuate these estimates using qualitative judgment.

- iv. Combine the estimated standard errors for the individual parameters and correlations between them to estimate a ‘standard error’ for the cost of capital.
- v. Apply this standard error to either side of the cost of capital estimate to derive a plausible cost of capital range.

Applying the ‘complex analytical approach’ to EDBs/GPBs and Transpower

H11.43 Estimating each of the individual cost of capital parameters and their associated standard errors using the procedures discussed above gives the following results:

Table H21 Parameter Point Estimates and their Standard Error

Parameter	Point estimate	Standard error
Leverage	44%	0
Risk-free rate	To be estimated	0
Debt premium	To be estimated	To be estimated, with a minimum value of 0.0015
Debt issuance cost	0.35%	0
Asset beta (EDB and Transpower)	0.34	0.13
Asset beta (GPB)	0.44	0.14
Tax-adjusted market risk premium	7% -7.5%	0.015
Corporate and investor tax rate	28% - 30%	0

H11.44 As discussed above, in some cases the standard errors will be readily available (e.g. if the parameters have been econometrically estimated); in other instances, the Commission must rely on qualitative judgement to specify plausible values.

Leverage

H11.45 In the case of leverage, the IM assumes a standard error of zero.¹²⁶⁷

H11.46 As discussed in section H3 on Leverage, due to the anomaly associated with the simplified Brennan-Lally CAPM the Commission applies a notional leverage estimate based on the average leverage of the comparative firms’ sample. This notional level of leverage is necessary to make the cost of capital invariant to

¹²⁶⁷ A number of submitters disagreed with the assumption that the standard error for leverage should be zero and considered that it should be 10%-11%. For example see Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: PricewaterhouseCoopers, *Submission on the Cost of Capital parameter estimates in the Commerce Commission’s Draft Electricity Distribution Services Input Methodology Determination: a report prepared for Electricity Networks Association*, 13 August 2010, p. 15; Transpower New Zealand Ltd., *Submission on Transpower (Input Methodologies) Draft Reasons Paper and Individual Price-Quality Path*, Attachment: Graeme Guthrie, *Measurement Error and Regulated Firms’ Allowed Rates of Return*, 14 August 2010, pp. 14-15; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: Guthrie G. *Comments on the Commerce Commission’s Input Methodologies Draft Reasons Papers: a report prepared for Telecom New Zealand Limited*, 12 August 2010, p. 10-11; Unison Networks Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, p. 19; Vector Limited, *Submission in response to the Commerce Commission’s Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, 13 August 2010, pp. 28-29.

changes in leverage. If the Commission were to assume a non-zero estimate for the standard error for leverage the estimate of the cost of capital would vary with leverage. This would contradict the reason the Commission is applying notional leverage, i.e. the cost of capital would change due to leverage.

Risk-free rate

H11.47 The risk-free rate also has a zero standard error. Although the risk-free rate does vary on a day-to-day basis, there is no uncertainty as to what the rate actually is at any one time.

H11.48 Professor Guthrie (for Transpower and Telecom) disagreed with the assumption that the standard error for the risk-free rate should be zero. Professor Guthrie argued that the cost of capital was affected by intra-cycle variance in the risk-free rate during the regulatory period.¹²⁶⁸

H11.49 Dr Lally reviewed Professor Guthrie's submission. He concludes that intra-cycle changes in the risk-free rate are "... so much less significant than that of estimation errors in respect of other parameters [the market risk premium and the equity beta] that it can reasonably be ignored."¹²⁶⁹ Further, the Commission notes that there are a number of instruments available in the financial markets to allow a supplier of a regulated service to manage any intra-cycle variation in risk-free rates during (and beyond) the regulatory period.

Debt issuance costs and tax rates

H11.50 As for debt issuance costs, the corporate and investor tax rate, the Commission considers that these parameters are not associated with significant levels of uncertainty. See the respective sections for the explanations.

Debt premium, TAMRP and asset beta

H11.51 As outlined above, the debt premium, TAMRP and asset beta usually have uncertainty associated with their estimation due to the estimation techniques used, and should therefore have a standard error greater than zero attached to them. The estimation of the standard error of each of these parameter estimates is covered in their respective appendices:

- i. debt premium (see paragraphs H5.73 to H5.76);
- ii. TAMRP (see paragraphs H7.124 to H7.131); and
- iii. Asset beta (see paragraphs H8.199 to H8.206).

Selecting the cost of capital range

H11.52 If the cost of capital is set too low it might incorrectly suggest that a supplier of regulated services was not limited in its ability to extract excessive profits. If the

¹²⁶⁸ Transpower New Zealand Ltd., *Submission on Transpower (Input Methodologies) Draft Reasons Paper and Individual Price-Quality Path, Attachment: Graeme Guthrie, Measurement Error and Regulated Firms' Allowed Rates of Return*, 14 August 2010, pp. 14-15; Telecom Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers, Attachment: Guthrie G. Comments on the Commerce Commission's Input Methodologies Draft Reasons Papers: a report prepared for Telecom New Zealand Limited*, 12 August 2010, pp. 7-9; Telecom, *Submission on Input Methodology Draft Reasons Papers, Comments by Graeme Guthrie*, 12 August 2010, pp. 6-11.

¹²⁶⁹ Lally, M., *Comments on measurement error and regulated firms' allowed rates of return*, 13 September 2010, pp. 11-13.

supplier were to reduce prices as a response to such an incorrect indication of excessive profitability, this might prevent the supplier from attracting sufficient capital to undertake efficient investment. This would be inconsistent with s 52A(1)(a) of the Act and would not be in the long term interests of consumers. Equally, a cost of capital that is set too high would mask the regulated supplier's ability to extract excessive profits over the medium or long-term.¹²⁷⁰ This would be inconsistent with s 52A(1)(d) of the Act.

H11.53 In balancing the risk between setting the cost of capital too high or too low, the Commission has to make an assessment as to the consequences of error. The consequences depend on the regulatory context in which the estimate of the cost of capital is being used. In some regulatory contexts a cost of capital estimate below the midpoint might be considered;¹²⁷¹ in other contexts the midpoint is appropriate, in other contexts a cost of capital estimate that is above the midpoint may be recommended.

H11.54 The Commission's choice over the precise percentile estimate of the cost of capital that is used for each regulatory instrument is informed by a number of factors, including considering:

- That the purpose of Part 4 is to promote the long term benefit of consumers, including:
 - i. ensuring suppliers of regulated services have incentives to invest and innovate, which will benefit consumers over time (s 52A(1)(a));
 - ii. ensuring suppliers of regulated services are limited in their ability to extract excessive profits (s 52A(1)(d));
- that in workably competitive markets the risks are borne by the party that is best equipped to manage these risks. That is not all risks can be passed on to the consumer and that firms will have to manage some of the risks themselves;
- the risk that the true (but unobservable) cost of capital is above the estimated mid-point WACC;
- the risk that CAPM and the simplified Brennan-Lally CAPM may underestimate the returns on low beta stocks;
- the risk that the use of a domestic CAPM (simplified Brennan-Lally) may lead to higher estimates of the cost of capital than the international CAPM and that international investors can be viewed as the key marginal investors;
- the impact on potential subsequent investment by service users and the potential impacts on dynamic efficiency; and

¹²⁷⁰ The Commission notes that, in the short-term, suppliers of regulated services may achieve above-normal profits if they outperform the objectives set by the regulator.

¹²⁷¹ IPART notes this point in their cost of capital review, see *Alternative approaches to the determinations of the cost of equity – other industries discussion paper*, November 2009, p. 18. Such an approach may be appropriate in setting the cost of capital for a service, if there is a significant subsequent investment by a user of that service, which is likely to bring greater benefits to end-users, relative to any investment by the original service provider.

- considering the risk of error in estimating individual parameters of the simplified Brennan-Lally CAPM including beta and the TAMRP. For example, the Commission has considered the risk that the values for some parameters may be above their true (but unobservable) level including, for example, the estimated asset beta, debt issuance costs.

Information disclosure regulation - the cost of capital range for EDBs/GPBs and Transpower

- H11.55 All suppliers of regulated services are subject to information disclosure regulation. The purpose of information disclosure regulation is to provide interested persons with sufficient information to assess whether the Part 4 Purpose is being met.
- H11.56 In the Draft Reasons Papers the Commission considered that the appropriate range for information disclosure would be between the 25th to 75th percentiles.
- H11.57 Suppliers of regulated services considered the range was too narrow and did not adequately cover risks, and market frictions.¹²⁷² Some recommended a range between the 5th to the 95th percentile.¹²⁷³
- H11.58 The Commission notes that a number of the criticisms of the cost of capital range were directed at a parameter's standard error (e.g. asset beta, TAMRP and debt premium). These issues are covered in the respective sections for the parameter.
- H11.59 It is a matter of judgement as to what is the appropriate range of the cost of capital to be applied in assessing excess profits. The Commission considers that it needs to balance all of the considerations above and recognises that returns in competitive markets often fall below or exceed the mid-point of the cost of capital. On this basis the Commission considers it appropriate to take a range between the 25th to 75th percentiles.

¹²⁷² Christchurch International Airport Ltd., *Submission on Input Methodologies and Information Disclosure Draft Determinations and Reasons Papers for Airport Services*, 12 July 2010, p. 41; NZ Airports, *Submission on Draft Input Methodologies Determination and Draft Reasons Paper*, 12 July 2010, p. 9; NZ Airports Association, *Submission on Draft Information Disclosure Determination and Draft Reasons Paper*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper - Report for NZAA*, 12 July 2010, pp. 38-46; Wellington International Airport Ltd., *Submission on the Draft Input Methodologies & Information Disclosure (Airport Services) Determinations and Draft Reasons Papers*, 12 July 2010, p. 19; Auckland International Airport Limited, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p. 12; NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, 3 August 2010, p. 41; NZ Airports Association, *Cross Submission on the Draft Input Methodologies (Airport Services) Determinations and Draft Reasons Papers*, Attachment: Uniservices, *Comments on Air New Zealand's and Board of Airline Representatives New Zealand Incorporated's Submissions to the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper: report prepared for New Zealand Airports Association*, 3 August 2010, pp. 17-18; Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: LECG, *Response to Commerce Commission's Draft Cost of Capital Input Methodology: a report prepared for the Electricity Networks Association*, 13 August 2010, pp. 9-15; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, p. 19; KPMG, *Cross-Submission on GPBs (Input Methodology) Draft Reasons Paper, Cost of Capital*, 13 August 2010, pp. 13-14.

¹²⁷³ NZ Airports, *Submission on Draft Input Methodologies Determination and Draft Reasons Paper*, 12 July 2010, p. 9; NZ Airports Association, *Submission on Draft Information Disclosure Determination and Draft Reasons Paper*, Attachment: Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital in its Input Methodologies Draft Reasons Paper - Report for NZAA*, 12 July 2010, pp. 38-46; KPMG, *Cross-Submission on GPBs (Input Methodology) Draft Reasons Paper, Cost of Capital*, 13 August 2010, pp. 13-14.

H11.60 The use of this range recognises uncertainty in the estimation of the cost of capital. It also recognises that profitability measures (such as ROI) can fluctuate on a yearly basis.

Default/customised and individual price quality regulation - the cost of capital point estimate for EDBs/GPBs and Transpower

H11.61 Given the imprecision of the cost of capital estimation process, the Commission considers it may be preferable, in the context of non-exempt EDBs, GPBs and Transpower that will be subject to default/customised or individual price-quality regulation, to err on the side of caution. That is, if a point estimate is required to set the price/quality path for this service, a figure above the mid-point of the range may be used.

H11.62 The reason for the Commission adopting under Part 4 a cost of capital estimate that is above the mid-point is that it considers the costs from the point of view of consumers associated with underestimation of the cost of capital in the Part 4 regulatory setting, are likely to outweigh the short-term costs of overestimation. That is, the Commission acknowledges that where there is potentially a trade-off between dynamic efficiency (i.e. incentives to invest) and static allocative efficiency (i.e. higher short-term pricing), the Commission, under Part 4, generally favours outcomes that promote dynamic efficiency. Accordingly, this consideration has been given greater weight for price-quality regulation than minimising the costs to consumers of regulated suppliers earning excess profits through higher prices in the short-term.

H11.63 In the EDBs, GPBs and Transpower Draft Reasons Papers, the Commission considered that the appropriate point estimate for the cost of capital for the DPP, CPP and IPP would be based on the 75th percentile.

H11.64 Suppliers of regulated services considered the application of the 75th percentile did not adequately cover errors and risks.¹²⁷⁴ The Commission notes that a number of the criticisms to the cost of capital range were directed at a parameter's standard error (e.g. asset beta, TAMRP and debt premium). These issues are covered in the respective sections for the parameter.

H11.65 It is a matter of judgement as to what is the appropriate percentile of the cost of capital to be applied when considering DPPs, CPPs and IPP. The IM specifies a

¹²⁷⁴ Transpower New Zealand Ltd., *Submission on Transpower (Input Methodologies) Draft Reasons Paper, Cost of Capital Decisions*, August 2010, p. 12; Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, pp. 11-12; Electricity Networks Association, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, Attachment: LECG, *Response to Commerce Commission's Draft Cost of Capital Input Methodology: a report prepared for the Electricity Networks Association*, 13 August 2010, pp. 9-15; Powerco Limited, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, p. 9; PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Submission on the Draft Input Methodologies Cost of Capital (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 13 August 2010, p. 19; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 35-45; KPMG, *Cross-Submission on GPBs (Input Methodology) Draft Reasons Paper, Cost of Capital*, 13 August 2010, pp. 13-14.

point estimate for the cost of capital for the DPP, CPP and IPP that is based on the 75th percentile of the cost of capital range. This reflects:

- the Part 4 Purpose (the long term benefit of consumers);
- the uncertainty in estimating the true cost of capital; and
- that in workably competitive markets not all risks can be passed on to the consumer in the form of higher prices. Insetad, in workably competitive markets firms have to manage some risks.

H11.66 Selecting a higher percentile estimate such as the 95th percentile would imply that almost no risk was to borne by suppliers, and that suppliers were price-makers who set the price for users. Such an outcome is not consistent with promoting the long-term benefit of consumers by promoting outcomes consistent with outcomes produced in workably competitive markets.

H11.67 The Commission also notes that selecting a higher percentile estimate such as the 95th percentile would result in an estimate of the cost of capital that would not be considered reasonable having regard to the reasonableness information described in Appendix H13.

H12 Possible Adjustments to the Cost of Capital for Asymmetric Risk

Decision - possible adjustments to the cost of capital

H12.1 The IMs do not make any adjustments to the cost of capital for asymmetric risk. However, the Commission does consider that it may be appropriate to deal with asymmetric risks through some other forms of adjustment or mechanisms, such as adjustments to regulatory cash flows with the use of flexible depreciation (e.g. a front-loaded depreciation profile in the event that asset standing becomes apparent).

Commission's reasons - possible adjustments to the cost of capital

H12.2 The IM applies a 'benchmark' or service-specific cost of capital for all suppliers of a regulated service. If the Commission were to apply an ad-hoc adjustment to the service-wide cost of capital it would imply that all suppliers of a particular service are exposed to the same level of asymmetric risk. However, suppliers of a regulated service are exposed to different levels of asymmetric risks and at possibly different time periods. If the IMs were to make an ad-hoc adjustment for asymmetric risks in the service-wide cost of capital, it may over-compensate some suppliers and possible under-compensate other suppliers.

H12.3 A firm faces asymmetric risk when its distribution of returns is truncated at one extreme without an offsetting truncation at the other. In other words, the firm's payoffs are 'asymmetric'. For example, in competitive markets existing firms may be exposed to the risk of new entry that would erode upside returns when the market is profitable. However, when the market is unprofitable entrants are unlikely to arrive so incumbent firms are left to entirely bear any losses. This type of cost is specific to the individual supplier and is not compensated for in the standard cost of capital estimations. Similarly, in monopolised markets regulation can cap potential profits without providing commensurate insulation from downside risk. All firms

may also be exposed to stranding risk (e.g. through technical obsolescence, unfavourable demand shocks), and large catastrophic events such as natural disasters.

H12.4 For clarity, it is useful to distinguish two categories of asymmetric risk:

- Type I risks are risks that are generally unrelated to the day-to-day operations of the firm, and arise through infrequent events that could produce large losses. Examples include natural disasters; pandemics; terrorist threats; or large, unexpected policy shifts that could force the shutdown of operating plant before the end of its economic life.
- Type II risks are risks that derive from such events as the threat of competitive entry or expansion. That is, there tends to be a cap on any significant upside to the firm, but typically not the significant downside risk that it faces. On the downside, assets can become stranded through technical innovations that unexpectedly lower operational costs or through negative demand shocks.

H12.5 The treatment for each of these types of risk differs, and so the discussion below deals with each separately.

Type I asymmetric risk

H12.6 The events that give rise to Type I risk are events that firms would naturally wish to insure against. Insurance markets typically provide no cover for catastrophic risks, so firms—even those operating in competitive markets—are often left to self-insure.¹²⁷⁵

H12.7 The lumpy and extreme nature of events that give rise to Type I risk means it is often unfeasible for firms in workably competitive markets to recover the cost of catastrophic events after the fact. Often, the only option available to firms is to self-insure in advance. Since one aim of regulation is to mimic outcomes that are consistent with those of workably competitive markets, any scheme designed to deal with Type I risk should ideally allow some *ex ante* recovery. On the other hand, regulators are in the unique position of being able to make *ex post* adjustments with the benefit of hindsight. Therefore, a scheme that permits some flexibility in this regard is desirable.

H12.8 A number of suppliers of regulated services submitted that an allowance for asymmetric risks should be included within the cost of capital.¹²⁷⁶ Some of these

¹²⁷⁵ Froot, K. A., *The Financing of Catastrophic Risk*, NBER Project Report Series, University of Chicago Press: Chicago & London, 1999, p. 3.

¹²⁷⁶ Auckland Energy Consumer Trust, Submission to the Commerce Commission on Input Methodologies, 14 August 2009, pp. 18-19; Auckland Airport, Commerce Commission Draft WACC Guidelines Paper, 31 July 2009, p. 3; Unison Networks Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: Castalia Strategic Advisors, *Submission on Input Methodologies: Regulatory Cost of Capital: a report prepared for Unison Limited*, 13 August 2009, pp. 6-7; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital, Report on behalf of ENA*, 11 August 2009, pp. 13-15; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital, Report prepared for the NZAA*, 31 July 2009, p. 26; Maui Development Limited, *Submission to the Commerce Commission on the Input Methodology Discussion Paper*, July 2009, p. 20; NZ Airports, *Submission by NZ Airports Association on the Commerce Commission Input Methodologies Discussion Paper*, 31 July 2009, p. 81; Orion, *Submission on Input Methodologies Discussion Paper*, 14 August 2009, p. 30; Powerco Limited, *Input Methodologies Discussion Paper*, 14 August 2009, p. 6; PricewaterhouseCoopers, *Submission to the Commerce Commission on the Revised Draft Guidelines – The Commerce Commission's Approach to Estimating*

submitters considered that the Commission could make allowance by adopting a point estimate at the upper end of the estimated plausible range. However, other submitters argued that choosing a point at the higher end of the range did not make any allowance for asymmetric risks.¹²⁷⁷

- H12.9 The Commission recognises that choosing a point estimate at the upper end of the range would be difficult to quantify and would risk becoming conflated with the unrelated issue of recognising the potential asymmetries arising from estimation uncertainty. In addition, whilst allowing an uplift to the cost of capital might provide firms with the necessary revenues to undertake self insurance, without any form of ‘ring fencing’ arrangements in place, it is unlikely to provide consumers with any guarantee that the additional funds would be employed for that purpose. The Commission’s decision is therefore to not make any adjustments to the cost of capital for Type I asymmetric risk.
- H12.10 With these issues in mind, the Expert Panel in their report proposed a hybrid scheme that mixes *ex ante* and *ex post* allowances. In particular, they recommended that the Commission handle Type I risks by allowing regulated firms to charge an ‘insurance premium’ that is invested in a reserve fund, which would pay out in the event of a Type I occurrence (effectively, a form of self-insurance that simulates what might otherwise occur, absent regulation). *Ex post* adjustments could be made if the fund proves inadequate or too generous.
- H12.11 Such a scheme has potential benefits in securing continuity of services, and reducing the need for firms to demand significant price increases in the event that such a risk were to crystallise. However, the Commission acknowledges that there would be a number of practical challenges in implementing such a scheme, not least the requirement to calculate an appropriate annual premium.
- H12.12 An alternative approach might be to require the firm to set-up its own self-insurance fund, with payments into the fund allowed to be borne as an operational expense subject to pre-determined conditions on the management and operation of the fund.

Conclusion - compensating supplier for Type I asymmetric risk

- H12.13 The IM does not make any adjustments to the cost of capital for Type I asymmetric risk.

Type II asymmetric risk and real options

- H12.14 Type II asymmetric risks are potentially large in industries that are: (i) characterised by long-lived, irreversible (large sunk cost) investments; and (ii) subject to substantial uncertainty over such things as future demand and costs.

the Cost of Capital, Report on behalf of 17 EDBs, 14 August 2009, p. 4 and pp. 15-16; PricewaterhouseCoopers, *Revised Draft Guidelines – Submission to Commerce Commission*, Report on Behalf of Powerco, August 2009, pp. 37-38; Telecom, *Submission on Commerce Commission Revised Draft Guidelines for estimating the Cost of Capital*, August 2009, pp. 6-7; Unison, *Appendix: Submission on Revised Draft Guidelines: The Commerce Commission’s Approach to Estimating the Cost of Capital*, 14 August 2009, pp. 10-11.

¹²⁷⁷ PricewaterhouseCoopers, *Revised Draft Guidelines – Submission to Commerce Commission*, Report on Behalf of Powerco, August 2009, pp. 37-38; Unison Networks Limited, *Submission on the Input Methodologies Discussion Paper*, Attachment: Castalia Strategic Advisors, *Submission on Input Methodologies: Regulatory Cost of Capital: a report prepared for Unison Limited*, 13 August 2009, pp. 6-7.

- H12.15 Real options theory suggests that in industries with such features, firms will not enter or invest unless the (conventionally calculated) expected rate of return is above normal.¹²⁷⁸ Instead, firms will wait until expected profits are large enough to cover both the cost of capital and the type II asymmetric risks associated with entry. Such delay can occur in workably competitive markets that are characterised by significant uncertainty and a high degree of sunk costs, and can be efficient. Hence, the presence of type II asymmetric risk creates a timing decision and suggests that there potentially should be either a mark up on the standard cost of capital estimate or some upward adjustment to allowed revenues.
- H12.16 Uniservices (for NZAA) and LECG (for ENA) indicated that new investments by regulated suppliers were sunk and irreversible, which may provide incentives for a supplier to delay making those investments.¹²⁷⁹ LECG further submitted that the Commission should increase suppliers' allowed rate of return as a result of real options. LECG argued that such an outcome would be consistent with outcomes expected in workably competitive markets where suppliers tend to set hurdle-rates for new investments that are above the normal rate of return.
- H12.17 The Commission notes that it was not clear from arguments presented by submitters that their request for an increased allowed rate of return was because of the existence of an asymmetric risk. At the same time, the Commission acknowledges that suppliers might set hurdle-rates for new investments above the normal rate of return on a project-by-project basis. However, as some of these projects are likely to perform better than others, the Commission considers that, on average, and suppliers will achieve a normal rate of return on the long-term, and this will be reflected in their long-term expectations. Further, such policies used by firms may not be a reflection of asymmetric risk faced by firms, but the need of the business to discipline overly optimistic forecasts by project managers.
- H12.18 In a submission on behalf of Telecom, Professor Guthrie argued that it was appropriate for the Commission to account for real options, and drew attention to the real options/investment timing model developed by McDonald and Siegel.¹²⁸⁰ While Professor Guthrie noted that in the McDonald and Siegel model the firm holds a perpetual option to develop a project (and thus had some market power over the project), he considered that the model could easily be modified so that the development option was not perpetual.
- H12.19 Specifically, Professor Guthrie outlined that a workably competitive market outcome could be captured by taking into account the potential for the threat of pre-emption and extinguishing the option at some unknown future date. In particular, he argued that:¹²⁸¹

¹²⁷⁸ 'Conventionally calculated' refers to ordinary procedures, which assume symmetric payoff distributions.

¹²⁷⁹ LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report on behalf of ENA, 11 August 2009, pp. 12-15; Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital*, Report on Behalf of NZAA, 2 December 2009, p. 67.

¹²⁸⁰ McDonald, R., and Siegel, D., The Value of Waiting to Invest, *Quarterly Journal of Economics*, Vol. 101, 1986, pp. 707-728.

¹²⁸¹ Guthrie, G., *Further Notes on Incorporating Real Options in Regulated Prices*, Submission to the New Zealand Commerce Commission on behalf of Telecom New Zealand Ltd, 2 December 2009, p. 11.

- Under perfect competition, the firm can be expected to be pre-empted if it delayed investing - even for an instant - when the asset created by investment is worth more than the capex required. In this case, the expected time until pre-emption is zero.
- At the other extreme, if the firm is the only one able to invest, it could delay indefinitely without any threat of pre-emption. In this case, the expected time until pre-emption is infinite.
- Workable competition will lie somewhere between these two extremes.

H12.20 In arguing for real options to be taken into account, Professor Guthrie did not argue for an increment to the cost of capital. Instead, in his submissions and at the Cost of Capital Workshop, he maintained that the Commission should take real options into account by employing a service-specific multiplier on the value of the RAB. He suggested that this would potentially solve the problem of requiring a mark-up on the cost of capital as a regulated supplier would only ever be earning its cost of capital.¹²⁸²

H12.21 A number of parties including the AECT, Uniservices (for NZAA), Wellington Electricity and PwC (for Telecom) supported the process of augmenting the RAB by Professor Guthrie's real option multiplier rather than adding an increment to the cost of capital.¹²⁸³

H12.22 NZIER (for BARNZ) argued against the adoption of a real options approach. It highlighted that advocates did not provide the Commission with any practical guidance as to how it could identify or value real options among the firms it was required to regulate, and did not identify any other regulators that have allowed for real options to be taken into account. Further, NZIER submitted that for Airports subject to information disclosure real options had no relevance, and was sceptical that real options were even relevant for price-path regulation.¹²⁸⁴

H12.23 As part of the Expert Panel's advice, Professor Myers recommended that timing options in the face of symmetric risk are a manifestation of market power, and regulators should not provide compensation for these. However, timing options extinguished in the face of Type II risk (asymmetric options) should be compensated for by the regulator. Dr Lally agreed that options exercised in the face of symmetric risk were a manifestation of market power that should not be compensated for and agreed that Type II asymmetric risk potentially warranted compensation. However,

¹²⁸² For full discussion between Professor Guthrie and the Commission on real options see the transcript from the Cost of Capital Workshop, *Cost of Capital Workshop Transcript*, pp. 65-71, (<http://www.comcom.govt.nz/IndustryRegulation/Part4/DecisionsList.aspx#1312>). For Professor Guthrie's submission see http://www.comcom.govt.nz/IndustryRegulation/Part4/ContentFiles/Documents/Telecom%20-%20Graeme%20Guthrie%20-%20WACC%20sub%20-%2020881160_1.pdf.

¹²⁸³ Auckland Energy Consumer Trust, *Cross Submission to Commerce Commission on Cost of Capital Workshop*, 2 December 2009, p. 17; Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital*, Report on Behalf of NZAA, 2 December 2009, p. 66; Wellington Electricity, *Post-Workshop Submission for the Commerce Commission's Cost of Capital Workshop, November 12 and 13, 2009*, 3 December 2009, p. 4; Telecom Limited, *Post-workshop Submission on the Cost of Capital*, Attachment: PricewaterhouseCoopers, *Cross Submission to the Commerce Commission on the Cost of Capital Workshop*, 2 December 2009, p. 7.

¹²⁸⁴ NZIER, *Cost of Capital, Report for Post-Workshop Submission, Report on behalf of BARNZ*, 28 November 2009, pp. 4-5.

he considered that a crucial feature of the Type II risk was asymmetry of the cash flows, rather than the presence of a timing option. Professor Franks recommended that any allowance for extinguished timing options be made through the regulatory cash flows.¹²⁸⁵

- H12.24 The Commission, in assessing real options, recognises that in order for such an approach to apply, investments need to be both irreversible and uncertain. While a significant proportion of investments in industries that provide regulated services (such airports, gas and electricity) are sunk, there is often a question as to whether regulated services have the requisite degree of demand and supply side uncertainty to warrant the use of such an approach.
- H12.25 In practice, most regulatory systems do not expose the returns on investments to the large fluctuations that might arise in current market current conditions. Instead, regulation tends to take a long-term approach, akin in many ways to long-term contracting, in that the regulator sets the value of assets when they enter the regulatory asset base, and does not adjust them thereafter. As long as businesses are allowed to earn a return of and on capital, with appropriate treatment of stranded assets, investors will (in theory) not have incentives to delay investment. In such circumstances, option values should disappear.¹²⁸⁶
- H12.26 The ability of long-term contracts to remove the need to explicitly account for real options in the presence of sunk costs and uncertainty is also highlighted by those advocating a real options approach in telecommunications access regulation. They note long-term contracting arrangements remove the uncertainties associated with cost recovery for sunk investments subject to uncertainty.¹²⁸⁷
- H12.27 To the extent there may be an issue of uncertainty and irreversibility of the investment in relation to the asset base, this is addressed in the regulatory regime through the roll forward mechanism that assesses new investments on an *ex ante* basis, e.g. ‘prudence reviews’ or requirements that investments be efficiently incurred. However, rather than delay investment, this approach often creates the risk of excessive investment by the regulated supplier, and investments being incurred ahead of the socially optimal time.
- H12.28 Even if there were risks such as asset stranding, these can be dealt with in the roll forward mechanism for the RAB by allowing for a depreciation profile that front loads the allowed returns as stranding becomes apparent or allow the stranded asset to remain in the RAB. Presently, the Commission provides for such flexibility in its treatment of the RAB.
- H12.29 The Commission notes that a real option to wait only has value where a firm has some level of market power. While in theory it has been shown that a single firm in a competitive market subject to sunk costs may have some incentive to delay

¹²⁸⁵ Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology, Report prepared for the Commerce Commission*, 18 December 2008, pp. 39-41.

¹²⁸⁶ Yarrow, G., Cave, M., Pollitt, M., Small, J., *Asset Valuation in Workably Competitive Markets - A Report to the New Zealand Commerce Commission*, May 2010, pp. 16-17.

¹²⁸⁷ See California Public Utility Commission, *Interim Decision Setting Final Prices for Network Elements Offered by Pacific Bell, California Public Utility Commission, Decision 99-11-050*, 18 November 1999, pp. 24-25 and footnote 26.

investments, the real option value of waiting will be equal to zero.¹²⁸⁸ Further, even in environments where there are only a small number of firms, provided one has a first-mover advantage, then it has been demonstrated in theory that a firm's ability to delay investment will be undermined by the fear of pre-emption. In such a scenario the traditional neoclassical NPV approach should be used to assess investments as opposed to a real options approach.¹²⁸⁹

H12.30 Presently, the Commission is not aware of any regulatory authority that has allowed for a real option surcharge to deal with asymmetric risk. In particular, concerns have been expressed by regulators about the potential for the regulator to compensate the regulated supplier for some form of market power. To the extent that there have been concerns about asset stranding these have instead been dealt with through allowing accelerated or front loading of the depreciation profiles as stranding becomes apparent.

H12.31 While the Commission outlined in the RDG and IM Discussion Paper that it would be open to submissions from suppliers that can prove, with substantive evidence, that Type II errors are a material issue and should be recognised, no party has met this threshold.¹²⁹⁰

H12.32 Submitters argued the Commission's approach imposed (and proposes to continue imposing) too high a 'burden of proof' on regulated firms such that no explicit allowance or recognition would ever actually be made.¹²⁹¹ The Commission maintains the view that this burden of proof is appropriate. Suppliers of regulated services are in a better position to provide information about the sunk nature of new investments and the likely uncertainty in the market place compared to the regulator. This position is consistent with the approach taken by Ofcom when it considered this issue.¹²⁹²

Conclusion - compensating supplier for Type II asymmetric risk and real options

H12.33 The IM's approach is to apply a 'benchmark' or service-specific cost of capital for all suppliers of a regulated service. If the Commission were to apply an ad-hoc adjustment to the service-wide cost of capital it would imply that all suppliers of a particular service are exposed to the same level of Type II asymmetric risk. However, suppliers of a regulated service are exposed to different levels of Type II

¹²⁸⁸ See Leahy, J., Investment in Competitive Equilibrium: The Optimality of Myopic Behavior, *Quarterly Journal of Economics*, Vol. 108, No. 4, 1993, pp. 1105-1133 and Dixit, A. K. and Pindyck, R. S., *Investment under Uncertainty*, Princeton: Princeton, New Jersey, 1994, Chapter 8.

¹²⁸⁹ Weeds, H., Strategic Delay in a Real Options Model of R&D Competition, *Review of Economic Studies*, Vol.69, No. 3, 2002, pp. 729-747.

¹²⁹⁰ Commerce Commission, *Revised Draft Guidelines - The Commerce Commission's Approach to Estimating the Cost of Capital*, 19 June 2009, p. 59.

¹²⁹¹ Auckland Airport, *Commerce Commission Draft WACC Guidelines Paper*, 31 July 2009, p. 3; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report on behalf of ENA, 11 August 2009, p. 14; LECG, *Comments on the Commerce Commission's proposed approach to estimating the cost of capital*, Report prepared for the NZAA, 31 July 2009, p. 26; PricewaterhouseCoopers, *Submission to the Commerce Commission on the Revised Draft Guidelines - The Commerce Commission's Approach to Estimating the Cost of Capital*, Report on behalf of 17 EDBs, 14 August 2009, p. 15; Telecom, *Submission on Commerce Commission Revised Draft Guidelines for estimating the Cost of Capital*, August 2009, p. 7; Uniservices, *Comments on the Commerce Commission's Approach to estimate the Cost of Capital*, Report on Behalf of NZAA, 2 December 2009, p. 66.

¹²⁹² Ofcom, *Ofcom's Approach to Risk in the Assessment of the Cost of Capital: Final Statement*, 18 August 2005, p. 43.

asymmetric risks and at possibly different time periods. If the IM were to make an ad-hoc adjustment for Type II asymmetric risks in the service-wide cost of capital, it may over-compensate some suppliers and possibly under-compensate other suppliers.

H12.34 The Commission considers that regulated suppliers have not provided evidence to demonstrate that a Type II asymmetric risk exists and needs to be compensated using a real options approach. On this basis, the Commission considers a real options approach that provides for a mark up in the cost of capital (or regulatory asset base) is not appropriate for dealing with Type II asymmetric risks.

H12.35 The Commission has more general concerns about the applicability of real options to all services regulated under Part 4. In particular:

- regulated firms are unlikely to be subject to the requisite degree of uncertainty for a real options approach to apply due to the long-term nature of regulation (comparable in many ways to a long-term contract) where an asset value is fixed at the moment it enters the RAB, and suppliers are allowed to earn a return on and of that investment. In workably competitive markets with sunk costs and uncertainty, the existence of long-term contracts mitigates the need for a real options approach;
- assigning a positive value to real options could reward a regulated supplier for its position of market power, which would be inconsistent with the Part 4 Purpose;
- the Commission is not aware of any regulatory precedent for taking into account real options in the cost of capital (or asset base); and
- to the extent that any Type II asymmetric risk does exist, the Commission considers this is better dealt with through front loading of the depreciation profile or cash flows, or allowing stranded assets to remain in the RAB, as has been done by other regulators.

H12.36 The Draft Reasons Paper noted the Commission remained open to receiving evidence from regulated suppliers, that Type II risks exist in the case of EDBs/GPBs and Transpower and that real options are a particular concern for them. However, EDBs/GPBs and Transpower would need to provide evidence of the Type II risk and demonstrate how real options could be incorporated. Limited submissions were received on this point, and the IM does not make allowance for these items, though the Commission notes they could be demonstrated in a CPP application.

H13 Reasonableness Checks on the WACC

H13.1 This section reports the estimates of the WACC as at September 2010 for EDBs, GPBs and Transpower using the IM. The estimate of the WACC for EDBs and Transpower is then compared with a range of comparative information to ensure it is a reasonable estimate of the cost of capital. The section also discusses the reasonableness of the estimate for GPBs.

The estimated WACC for EDBs and Transpower as at September 2010

- H13.2 Each regulatory instrument specifies when the WACC is to be calculated under that regulatory instrument. For EDBs under a DPP, the WACC is to be calculated as at 1 September 2009 for the purpose of making starting price adjustments. For Transpower’s first regulatory control period the WACC is to be calculated as at 1 September 2010. GPBs are subject to information disclosure regulation, but the cost of capital IM will not apply to DPPs or CPPs for GPBs until 2012.
- H13.3 For the purposes of testing the reasonableness of the WACC estimates produced by applying the IM, the Commission estimates the WACC as it would apply to EDBs and Transpower as at 1 September 2010. If the IM produces reasonable estimates at that date, it is also likely to produce reasonable estimates at other dates since the IM provides for regular updating of the risk-free rate and debt premium. Once a supplier is on a DPP or CPP however, the WACC which pertains to that regulatory period will not change.
- H13.4 Table H22 summarises the values of the fixed parameters as specified in the IM for EDBs and Transpower and estimates of the five-year risk-free rate and five year debt premium as at 1 September 2010 (using data from the month of August 2010).

Table H22 Parameter Point Estimates and their Standard Error as at 1 Sept 2010 for EDBs and Transpower

Parameter	Point estimate	Standard error
Leverage	44%	
Debt issuance costs	0.35%	
Asset beta	0.34	0.13
Equity beta	0.61	
Tax-adjusted market risk premium	7.1%	0.015
Average corporate tax rate	28.4%	
Average investor tax rate	28.2%	
Debt premium (as at 1 Sept 2010)	2.00%	0.0015 (minimum)
Risk-free rate (as at 1 Sept 2010)	4.64%	

- H13.5 Based on the parameter estimates in Table H22, Table H23 shows the estimates of the mid-point, and 75th percentile vanilla and post-tax WACCs as at September 2010.

Table H23 Estimated WACCs Using the Parameters Specified

Estimate of WACC	
Vanilla WACC	7.37%
Post-tax WACC	6.49%
Vanilla WACC (75th percentile)	8.09%
Post-tax WACC (75th percentile)	7.22%

H13.6 Under the IM, the 75th percentile of the vanilla WACC is to be applied for the purposes of DPPs and CPPs. Most New Zealand advisers and market participants use the post-tax WACC and most comparative information is of post-tax WACC estimates. To assist comparability, the reasonableness discussion below focuses on the post-tax WACC estimates reported in the above table. The rest of this section tests whether a post-tax WACC estimate of 7.22% for EDBs and Transpower is reasonable and commercially realistic in light of the comparative information on post-tax WACC estimates.

Will the WACC IM produce reasonable and commercially realistic estimates of the WACC?

H13.7 The Commission has tested the estimates of the WACC produced using the IM against a range of other information on expected and historic returns. This is to ensure that the cost of capital estimated by applying the IM is reasonable and commercially realistic given the returns expected on other investments, having regard to differences in risk. Doing so ensures that the returns available to suppliers of regulated services are sufficient to incentivise innovation and investment, and that suppliers are limited in their ability to extract excessive profits. It also ensures that the expected rates of returns for regulated suppliers are consistent with the expected returns of firms in workably competitive markets.

H13.8 The comparative information against which the WACC estimates are tested includes:

- estimates of the long-run historical returns earned by New Zealand investors on investments of average risk (over the period 1900-2009).
- estimates of future returns expected by New Zealand investors on investments of average risk.
- estimates of the post-tax WACC in other regulatory contexts especially in New Zealand, Australia and the United Kingdom.
- independent estimates of the post-tax WACC for New Zealand monopolies.
- estimates of the post-tax WACC using other approaches including the classical CAPM.

H13.9 The conclusions from this comparative analysis are that the estimate of the post-tax WACC for EDBs and Transpower using the IM is reasonable and commercially realistic for regulated suppliers. This is because the post-tax WACC estimate of 7.22% produced using the IM:

- is below the long-term historical (8.5%) and the forecast return on New Zealand investments of average risk (8.8%-9.3%) but well above the after-tax returns on five-year and 10-year government stock (3.2% and 3.7% respectively) and on five-year BBB+ bonds (4.6%). This is consistent with expectations as businesses such as Transpower and EDBs face lower risks than

the average New Zealand firm, but greater risks relative to corporate bonds and government stock;

- is similar to the Ofgem estimates for UK electricity and transmission businesses (6.8% and 7.2% respectively) and to the estimates (updated for subsequent changes in risk-free rates and debt premiums) used in the Transpower settlement (6.3%) and electricity lines decisions (6.5%);
- is below the AER's most recent estimate for Australian electricity distribution businesses (7.8%) due to differences in prevailing monetary conditions and taxation laws (neither of which are determined by the regulator), and the choice over the term of the risk-free rate and debt premium which matches the regulatory period (rather than a 10 year term preferred by the AER). However, the AER acknowledges its approach over-compensates suppliers and, in addition, the term credit spread allowance in the IM is not part of the WACC (but is reflected in cash flows for each supplier). The IM's approach to dealing with uncertainty over the estimation of the cost of equity appears more generous than the AER's approach in this regard;
- is in the middle of the range of publicly available independent estimates of WACC for NZ monopolies. For example, the IM post-tax WACC estimates are above PwC's estimate of the WACC for Vector (6.5%) and Horizon (6.2%), similar to estimates by two investment banks of Transpower's post-tax WACC (7.2% and 7.35%), but below the average broker forecast of the WACC for the Vector group including non-regulated businesses (8.0%); and
- is close to the estimates produced when applying the classical CAPM (7.5%).

H13.10 There is limited New Zealand information to test the reasonableness of the estimates of post-tax WACC for GPBs produced by the IM.¹²⁹³ The available overseas data suggest the post-tax WACC estimates for gas should be close to, or the same as for, EDBs. On theoretical grounds, the Commission considers NZ GPBs should have a higher WACC than EDBs, as they are considered to face greater systematic risks.

H13.11 The final section of this appendix discusses points raised in submissions which test the reasonableness of the post-tax WACC estimates produced using the IM.

Long-run returns earned by New Zealand investors on investments of average risk

H13.12 The actual returns earned historically by New Zealand investors provides one means of testing whether an estimate of a future rate of return (WACC) is realistic. The advantage of looking at historic returns is that they can be calculated without the need for an analytical tool such as CAPM. That is, it is independent of the analytical model, does not require a number of assumptions that such models require, and can be estimated without a consideration of systematic and unsystematic risk.

H13.13 Dimson, Marsh and Staunton of the London Business School are generally regarded as having produced the most authoritative source of historical returns to

¹²⁹³ Using the same parameters for EDBs and Transpower as used in this appendix, see Table H22 (except assuming an asset beta of 0.44, an equity beta of 0.79, and a standard error for the asset beta of 0.14), the 75th percentile estimate of post-tax WACC for GPBs is 8.0%. The midpoint estimate is 7.2%.

investors.¹²⁹⁴ Dimson, Marsh and Staunton have analysed returns to investors in over 20 countries. Dimson, Marsh and Staunton's data for New Zealand covers the period from 1900 to 2009; that is, over 100 years.

H13.14 Dimson, Marsh and Staunton estimate that the average return to New Zealand equity investors over the period 1900-2009 was 9.8% p.a.¹²⁹⁵ This is a nominal, pre-investor tax return. Over the same period, the return on government bonds was 5.8% p.a.¹²⁹⁶ The return on corporate debt is not calculated by Dimson, Marsh and Staunton, but for the purposes of this analysis it is assumed it falls midway between the return on government debt and the average for NZ equities (that is, 7.8%).¹²⁹⁷ At a corporate tax rate of 30%, assuming market-wide leverage of 30%, and no investor taxes on equity returns, this implies a post-tax WACC estimate of around 8.5% for an investment of average risk.

H13.15 This compares with a 7.22% post-tax WACC for a supplier of essential services such as an EDB or Transpower.

Future returns expected by New Zealand investors on investments of average risk

H13.16 Future expected returns can be estimated using CAPM. By definition, the market has an average equity beta equal to one. The analysis also assumes a TAMRP of 7.1%, leverage of 30%, a risk-free rate of 4.64%, a debt premium of 2.5%, issue costs of 0.35% per annum, and a corporate and investor tax rate of 28%. The lower leverage assumption and higher debt premiums are intended to reflect those for an average listed NZ firm. Under these assumptions, the estimated post-tax WACC is 8.9% (under both the classical and simplified Brennan-Lally CAPM).

H13.17 Using a 10 year estimate of the risk-free rate (of 5.35%), and the same other assumptions as set out in the preceding paragraph, the post-tax WACC would be 9.2% for the New Zealand market.

H13.18 The Cost of Capital Report is published quarterly by PwC and is a long-standing and well-known report to many users.¹²⁹⁸ It includes estimates of the post-tax WACC for around 70 New Zealand listed companies. The approach used by PwC is similar to the IM in a number of respects, including the use of the simplified Brennan-Lally CAPM model and a five-year term for the risk-free rate (of 4.9% as at June 2010).

H13.19 In the June 2010 Cost of Capital Report, PwC estimate that the average post-tax WACC for the approximately 70 companies they analyse, is 8.4%.

H13.20 Table H24 below summarises the information discussed above on the market average post-tax WACC, on a historic and forecast basis. It also shows the current

¹²⁹⁴ Dimson, E., P. Marsh, and M. Staunton, *2010 Global Investment Returns Yearbook 2010*.

¹²⁹⁵ Dimson, E., P. Marsh, and M. Staunton, *2010 Global Investment Returns Yearbook 2010*, p. 27. The Dimson, Marsh and Staunton estimates are estimated on a geometric basis. The arithmetic equivalent is 11.8%. The Dimson, Marsh and Staunton approach also makes no adjustment to the nominal returns on NZ investments despite these having likely been inflated during periods when New Zealand experienced high rates of inflation. The real returns would therefore be lower.

¹²⁹⁶ Dimson, E., P. Marsh, and M. Staunton, *2010 Global Investment Returns Yearbook 2010*, p. 27.

¹²⁹⁷ This is likely to be a conservative estimate of the cost of debt as it assumes a return on debt halfway between the return on government debt and the return on an equity investment of average risk

¹²⁹⁸ The report can be found at <http://www.pwc.com/nz/en/cost-of-capital>.

five-year and 10 year government bond rates (that is the returns on investment with no default risk) and the pre-tax cost of BBB+ corporate bonds.

Table H24 Market estimates of return on NZ investments of average risk

Approach	Estimate of post-tax WACC
Historical returns on NZ market for a firm of average risk	8.5%
Expected return on NZ market for a firm of average risk (using a five-year risk-free rate as at 1 September 2010)	8.9%
Expected return on NZ market for a firm of average risk (using a 10 year risk-free rate as at 1 September 2010)	9.2%
NZ Market weighted average WACC (PwC calculation), i.e. average risk	8.4%
Estimate of the post-tax WACC for an EDB / Transpower (at the 50th percentile as at September 2010). Essential service provider.	6.5%
Estimate of the post-tax WACC for an EDB / Transpower (at the 75th percentile as at September 2010). Essential service provider.	7.2%

H13.21 The estimates in the top part of Table H24 relate to the market average firm. That is, they are indicative of the post-tax WACC for a firm of average risk.

H13.22 EDBs (and Transpower), on the other hand, provide essential services, with very stable demand, face no real substitutes and have no or limited competition. As providers of essential services, used 24 hours a day 365 days a year by virtually every consumer in the country, they have locked-in users with no choices and little bargaining power. Such firms face significantly lower systematic risk than the average firm, and are the quintessential low risk business. Equity investors in such companies would expect to earn a lower return on their investments, than in an average NZ company. This conclusion is supported by the empirical estimates of beta by the Commission and of the expert advisors who provided beta estimates. No advisor submitted the equity beta for EDBs should equal one, or be above one (that is, no advisor submitted that EDBs face average or above average systematic risk).

H13.23 As would be expected, the estimates of the post-tax WACC for EDBs using the IM are modestly below the estimates of the WACC for a New Zealand firm of average risk. Specifically, they are between 2.1% and 1.6% below that for an investment of average risk at the 75th percentile (and between 2.8% and 2.3% at the midpoint WACC estimate below an investment of average risk). This is consistent with the analysis in the prior paragraph.

H13.24 The Commission notes that some suppliers, and some expert advisors on behalf of suppliers, provided estimates of the WACC for EDBs that were above, and sometimes significantly above, the estimate for a New Zealand firm of average risk.¹²⁹⁹ Such submissions did not provide an explanation for why EDBs could

¹²⁹⁹ For example, relying on its advisor CEG, Vector's submission implies the post-tax WACC should be 10.3-11.1%, assuming 43% leverage. PwC (for 20 EDBs) proposes 9.35% at the 75th percentile. LECG propose a point estimate of 8.60% and a high estimate (for application in pricing setting) of 10.13% before an allowance for model error of 1%. See: Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and*

reasonably be expected to have an estimated post-tax WACC which is above that of firms exposed to average risk. The Commission does not consider such estimates to be realistic estimates of post-tax WACC as estimates of the post-tax WACCs for EDBs which are above the estimated post-tax WACC for firms of average risk are implausible.

H13.25 The Commission considers a return on an investment of average risk to be at a level that is above the plausible maximum post-tax WACC for an EDB. The post-tax cost of debt for an EDB is below the plausible minimum post-tax WACC for an EDB. Table H25 below compares the post-tax return on fixed interest investments currently for the NZ market with the post-tax WACC estimates applying the IM.

H13.26 Using the IM approach gives an estimate of the midpoint post-tax WACC of around 3.2% above the post-tax yield on Government bonds, and 1.7% above the estimated post-tax yield on BBB+ bonds.

Table H25 Market estimates of return on NZ investments

Approach	Estimate of post-tax WACC
Post-tax yield on five-year government stock (Sept 2010) ¹³⁰⁰	3.2%
Post-tax yield on 10 year government stock (Sept 2010) ¹³⁰¹	3.7%
Post-tax yield on five-year BBB+ bonds (Sept 2010) ¹³⁰²	4.6%
Estimate of the post-tax WACC for an EDB / Transpower (at the 50th percentile as at September 2010)	6.5%
Estimate of the post-tax WACC for an EDB / Transpower (at the 75th percentile as at September 2010)	7.2%

H13.27 Comparing Table H24 and Table H25, the IM estimate of the post-tax WACC falls midway between the post-tax cost of debt and the post-tax WACC for a firm of average risk. This is appropriate and reasonable given the risks of investing in an EDB (or Transpower) would be expected to be greater than for BBB+ bonds, but lower than that for a firm of average risk.

Estimates of the WACC in other regulatory contexts

H13.28 This section considers estimates of the post-tax WACC in prior regulatory decisions, in New Zealand, the United Kingdom and Australia.

New Zealand

H13.29 A previous estimate of the post-tax WACC for electricity lines businesses was provided to the Commission in 2005 by Dr Lally who estimated a post-tax WACC

Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital, 13 August 2010, pp. 5, 26. PricewaterhouseCoopers on behalf of 20 Electricity Distribution Businesses, *Input Methodology for Electricity Distribution Services Cost of Capital*, 13 August 2010, p. 18. LECG, *Response to Commerce Commission's Draft Cost of Capital Input Methodology, Report for the Electricity Networks Association*, August 2010, p. 16.

¹³⁰⁰ Based on a 4.64% five-year yield and tax at 30%.

¹³⁰¹ Based on a 5.35% 10-year yield and tax at 30%.

¹³⁰² Based on 2% debt premium above a 4.64% five-year yield and tax at 30%.

of 7.4%, based on a then prevailing risk-free rate of 6.3% and a debt premium of 1.2%.¹³⁰³ Updating this solely for subsequent changes in risk-free rates and debt premiums, implies a midpoint post-tax WACC of 6.5%, which is slightly above the mid-point estimate under the IM.

H13.30 Transpower proposed a post-tax WACC of 7.8% as part of a settlement with the Commission in 2007, which was reviewed and accepted by the Commission. This assumed a risk-free rate of 7.2%. Updating this estimate to reflect subsequent changes in the risk-free rate and debt premium as at September 2010 produces a revised estimated post-tax WACC of 6.3%. This is very similar to the mid-point estimate produced using the IM.

United Kingdom

H13.31 Ofgem regulates the companies which run the UK gas and electricity networks. It uses estimates of the WACC for affected companies as part of its five-yearly Price Control Reviews. Its most recent price control proposals were issued for electricity distribution in December 2009,¹³⁰⁴ for gas distribution in December 2007,¹³⁰⁵ and for transmission in December 2006.¹³⁰⁶ Ofgem uses the classical CAPM to estimate a real post-tax WACC. To enable comparison, the Commission has converted Ofgem's estimates into nominal post-tax estimates. This produced estimates of the WACC of 6.8% for electricity distribution, 7.1% for gas distribution, and 7.2% for transmission.¹³⁰⁷ These are very close to the Commission's estimates of the post-tax WACC that would be applied to DPPs and CPPs.

Australia

H13.32 The AER is responsible for the economic regulation of the electricity transmission and distribution networks in the national electricity market (NEM) and for most gas transmission and distribution networks in Australia. The AER's most recent estimate of the vanilla WACC is for the Victorian electricity distribution network service providers.¹³⁰⁸ The AER proposed a vanilla WACC of 9.40% for CitiPower, Powercor and United Energy, 9.65% for SP AusNet and 9.95% for Jemina¹³⁰⁹. The differences in the vanilla WACC between the companies reflected the different periods in which the risk-free rate was estimated for each company.¹³¹⁰ To simplify the analysis, the analysis below focuses on the vanilla WACC of 9.4% calculated for the first three companies mentioned.

¹³⁰³ Lally, M., *The Weighted Average Cost of Capital for Electricity Lines Businesses*, Sept 2005, p. 105. This estimate includes issuance costs.

¹³⁰⁴ Ofgem, *Electricity Distribution Price Control Review Final Proposals – Allowed Revenue and Financial Issues*, 7 December 2009, p. 16.

¹³⁰⁵ Ofgem, *Gas Distribution Price Control Review Final Proposals (GDPCR)*, 3 December 2007, p. 105.

¹³⁰⁶ Ofgem, *Transmission Price Control Review Final Proposals*, 4 December 2006, p. 54.

¹³⁰⁷ Using the Fisher function and an assumed inflation rate of 2.7% consistent with the inflation expectation noted in Ofgem, *Electricity Distribution Price Control Review Final Proposals – Allowed Revenue and Financial Issues*, 7 December 2009, p. 10. The real vanilla WACC in GDPCR has been converted to a real, post-tax WACC and then to a nominal post-tax WACC.

¹³⁰⁸ AER, *Victorian electricity distribution network service providers, Distribution determination 2011-2015, Final decision*, October 2010.

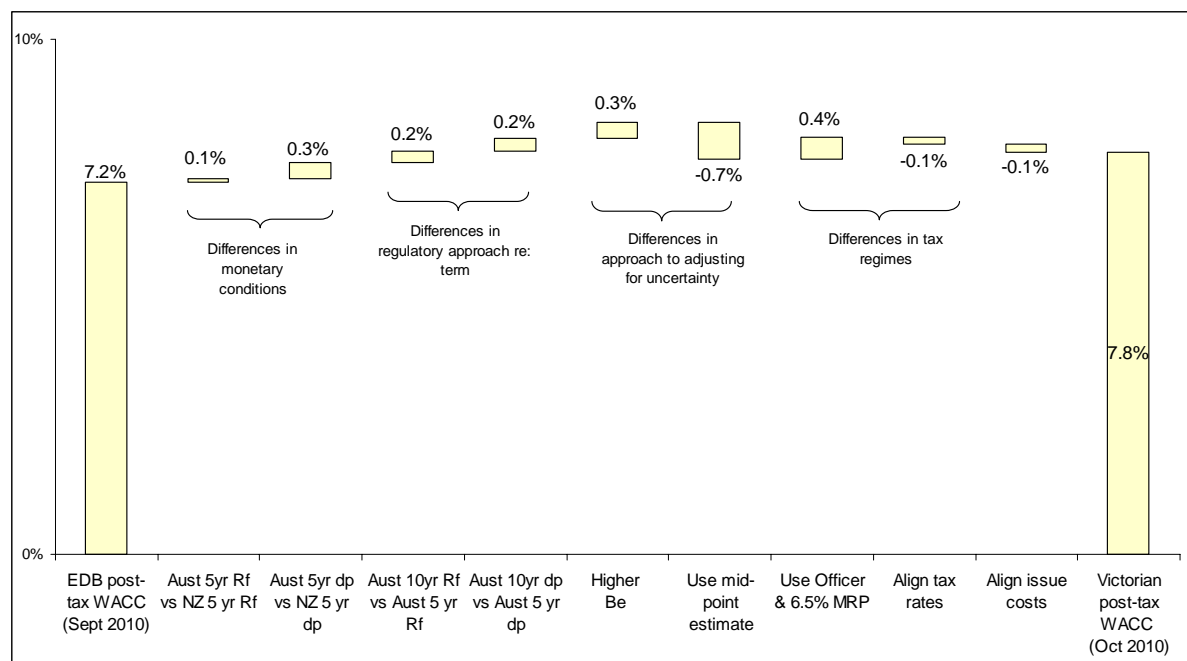
¹³⁰⁹ The AER's conclusion on Victorian electricity distributors is similar to its conclusions for companies in South Australia, Queensland and a NSW gas distribution service.

¹³¹⁰ AER, *Victorian electricity distribution network service providers, Distribution determination 2011-2015, Final decision*, October 2010, p. 477.

H13.33 The AER’s estimate is a vanilla WACC. As the analysis in this section focuses on post-tax WACCs, the Commission has converted the AER’s estimate to a post-tax WACC. This produced a post-tax WACC of 7.8%, around 0.6% above that under the IM.

H13.34 There are a number of differences between the AER’s estimate and that produced using the IM. These are set out in the Figure H13 and discussed below.

Figure H13 A comparison of Australian and New Zealand post-tax WACCs for regulatory purposes



H13.35 The differences highlighted in the figure fall into 4 main categories which are discussed in turn below:

- differences due to differences in monetary conditions prevailing in each country at the time when the risk-free rate and debt premium are estimated;
- differences in regulatory approach regarding the term of the risk-free rate and debt premium;
- differences in regulatory approach regarding the treatment of uncertainty particularly as regards estimating the cost of equity; and
- differences in tax regimes.

Differences in monetary conditions

H13.36 At the time the AER and the IM estimates were made, Australian 5 year risk-free rates and debt premiums were higher than in New Zealand. Higher Australian interest rates increased the AER’s post-tax WACC by 0.1% relative to the IM estimate, while the higher Australian debt premium increased the AER’s post-tax WACC by a further 0.3%.

H13.37 These differences are a function of differing monetary conditions between Australia and New Zealand at different points in the economic and monetary cycle. Risk-free rates and debt premiums change over time. At other points in the cycle, estimates of the WACC under the IM could be higher or lower than the AER's estimate.¹³¹¹

H13.38 The IM reflects the estimated post-tax WACC for a New Zealand firm having regard to New Zealand monetary conditions, not those in another country.

Differences in regulatory approach regarding term

H13.39 There is a difference in regulatory approach concerning the term of the risk-free rate and debt premium. The AER's methodology assumes a 10 year term on the risk-free rate and debt premium, whereas the IM provides for a five-year term. The Commission estimates the AER's use of a 10 year Australian risk-free rate in the IM increases the resulting estimate of the post-tax WACC by 0.2% compared with a five year Australian rate, and use of a 10 year debt premium rather than a five year term increased the post-tax WACC by a further 0.2%.

H13.40 The IM's use of the five-year term of the risk-free rate compensates suppliers appropriately. As discussed in paragraphs H4.29 to H4.59, use of a 10 year term will over-compensate suppliers when the interest rate yield curve is upward sloping, and under-compensate suppliers when it is downward sloping. Further, use of a 10 year rate compensates suppliers for a risk borne by consumers. Regulated suppliers can and do make extensive use of interest rate swaps to shorten their repricing period. Accordingly, the term of the risk-free rate in the IM matches the term of the regulatory period. The AER acknowledges that its use of a 10 year risk-free rate can be expected to over-compensate suppliers.¹³¹²

H13.41 Through the term credit spread differential allowance the IM allows regulated suppliers to recover the greater premium on debt whose term exceeds that of the regulatory period (where the firm has actually incurred it). However, this is a separate allowance and is not part of the WACC (and not shown in Figure H13). By contrast, the AER's approach includes an estimate of the 10 year debt premium in its estimated WACC. To compare the AER and IM estimates on a like-for-like basis, the term credit spread differential allowance should be added to the IM WACC estimate. However, this is not practical since the amount of the term credit spread differential allowance will vary between regulated suppliers. Accordingly, a like-for-like comparison of approaches in regard to the premium on long-term debt is not practical.

H13.42 Finally, the Commission notes that while the AER currently uses a 10 year debt premium, this approach is increasingly being called into question by Australian regulators and the Australian Competition Tribunal.¹³¹³

¹³¹¹ For example, at September 2009 (the relevant date for estimating the WACC for SPA), the post-tax WACC is estimated at 7.7%, almost identical to the AER's estimate discussed above.

¹³¹² AER, *Electricity transmission and distribution network service providers Review of the weighted average cost of capital (WACC) parameters*, Final decision, May 2009, p. xiii and p. 154.

¹³¹³ Refer section on debt premium in this appendix. See paragraphs H5.23 to H5.26.

H13.43 In sum, there are strong reasons to set the term of the risk-free rate and the debt premium to match the regulatory period, rather than adopt a 10 year term as used by the AER.

Differences in regulatory approach to deal with uncertainty in estimating the cost of equity

H13.44 The AER and IM take different approaches to ensuring there are sufficient incentives to invest in regulated services. The IM specifies the 75th percentile estimate of the post-tax WACC to be used when setting price-paths, rather than the mid-point estimate of the post-tax WACC. This is to reflect the greater social costs of setting the WACC too low, versus the social costs of setting it too high (given the uncertainty in knowing what the true post-tax WACC is). The practical impact of this is to increase the estimate of the IM post-tax WACC by 0.7% relative to the mid-point.

H13.45 In contrast, the AER does not use a 75th percentile estimate of WACC. Rather, it sets the equity beta at a level which is above the level implied by the empirical estimates of beta which were considered by the AER. The AER explains that this is to achieve a WACC that ensures efficient investment in services for the long-term interest of consumers.¹³¹⁴ The AER's approach increases its estimate of the post-tax WACC by 0.4% when compared to the IM approach (at the mid-point WACC). This has a smaller impact on the post-tax WACC than the IM's use of the 75th percentile estimate.

Differences attributable to tax and issue costs

H13.46 The AER uses the Officer CAPM (and an MRP of 6.5%), while the IM uses the simplified Brennan Lally CAPM. The choice of the form of the CAPM reflects the differences in the New Zealand and Australian taxation regimes, in particular that there is no general capital gains tax in New Zealand. The AER's use of the Officer CAPM and a 6.5% MRP produces a post-tax WACC about 0.4% higher than the IM's SBL CAPM with a 7.1% TAMRP.

H13.47 The AER continues to use a 6.5% MRP estimate, which was increased from 6% after the GFC. The AER maintains its view that the long run Australian MRP is 6% and that this should be "adopted as market conditions return to those seen pre-GFC."¹³¹⁵ The AER was not yet persuaded that market conditions have stabilised. The Commission notes that the 6.5% MRP estimate used by the AER is higher than that used by most other Australian regulators, including the ACCC which has reverted back to its long-term view of the Australian MRP (being 6%, the same as the AER's view). If the AER moves back to its long-run estimate of the Australian MRP, the regulated post-tax WACC for Australian energy firms will fall by 0.2%, all other things remaining unchanged. The corresponding change in post-tax WACC from estimating the TAMRP under the Commission's long-term view of the New Zealand TAMRP (7%), will reduce the New Zealand post-tax WACC by 0.1%. In sum, if both the Australian and New Zealand estimates reverted to the long-run

¹³¹⁴ AER, *Electricity transmission and distribution network service providers Review of the weighted average cost of capital (WACC) parameters, Final decision*, May 2009, p. 343-344.

¹³¹⁵ AER, *Victorian electricity distribution network service providers, Distribution determination 2011-2015, Final decision*, October 2010, p. 484.

estimates of the market risk premium, this would reduce the difference between the respective post-tax WACC estimates by 0.1%.

H13.48 The IM compensates firms for debt issuance costs through the post-tax WACC, whereas the AER does not include such costs through the post-tax WACC. This explains 0.1% of the difference between the IM and AER post-tax WACC estimates.

Summary of the differences between the AER and the IM

H13.49 The Commission has compared the post-tax WACC estimates produced using the IM with the AER's post-tax WACC estimates, and considered the factors responsible for the differences. Some of these factors reflect differences in the respective taxation regimes and in prevailing monetary conditions, which are not determined by the respective regulators. The AER and the IM take different approaches to ensuring there are adequate incentives for investment in regulated services. The Commission considers its explicit allowance in the IM (through the 75th percentile estimate) is transparent and favourable to suppliers.

H13.50 There is also a difference in the term of the risk-free rate. A term of the risk-free rate that matches the regulatory term ensures suppliers are fairly compensated, with less risk of over- or under-compensation than a 10 year term, and more appropriately reflects regulated suppliers' exposure to base interest rates given their widespread use of interest rate swaps. The term credit spread differential allowance also compensates firms for the greater debt premium on longer term debt, to the extent this is incurred by firms, rather than over-compensating all firms which would occur if the debt premium was based on a 10 year term. On balance, the Commission considers the approach on these matters in the IM is preferable to that taken by the AER.

H13.51 Table H26 summarises the estimates from the regulatory decisions discussed above. The estimates produced via the IM are comparable to, and generally above, the estimates in the prior energy-sector regulatory decisions.

Table H26 WACCs in previous energy-sector regulatory decisions

Approach	Estimate of post-tax WACC
Updated Electricity Lines (Dr Lally for the Commerce Commission)	6.5%
Updated Transpower settlement	6.3%
Ofgem – electricity distribution	6.8%
Ofgem – gas distribution	7.1%
Ofgem – electricity transmission	7.2%
AER – Victorian electricity distribution (Oct 2010)	7.8%
Estimate of the post-tax WACC for an EDB / Transpower (at the 50th percentile as at September 2010)	6.5%
Estimate of the post-tax WACC for an EDB / Transpower (at the 75th percentile as at September 2010)	7.2%

Independent estimates of the WACC for NZ monopolies

H13.52 There are several publicly available estimates of the post-tax WACC for New Zealand monopolies, including EDBs, GPBs and Transpower, which have been produced independently of the regulatory context. These are discussed below.

H13.53 PwC includes estimates of the post-tax WACC for Vector and Horizon in its June 2010 Cost of Capital Report. For Horizon, an EDB, PwC estimates a 6.2% post-tax WACC, and a 6.5% post-tax WACC for Vector.¹³¹⁶ These estimates are consistent with the IM mid-point estimate of the post-tax WACC, but lower than the 75th percentile estimate.

H13.54 A number of New Zealand investment banks publish research on New Zealand listed companies. In particular, a number of brokers have estimated the post-tax WACC for Vector, as an input into valuing a share in the ownership of Vector. The post-tax WACC estimates range from 7.35% to 8.5% with an average of 8.0%. That is, the broker estimates for Vector's cost of capital are above the IM estimate of the post-tax WACC for EDBs. For at least two reasons, the Commission would expect the broker estimates to be higher than the IM estimates in respect of EDBs.

- First, the broker estimates of Vector's post-tax WACC cover all of Vector (including gas, electricity, telecoms, gas wholesaling, and metering), whereas the IM focuses solely on regulated services (electricity distribution and gas pipeline services). The post-tax WACC for the supply of electricity distribution services in particular would be expected to be lower than for the other services provided by Vector and lower than for the overall company.¹³¹⁷ In this regard, the IM estimate for GPBs is 8.0% which is directly in line with the average broker estimate for all of Vector.
- Second, the brokers seek to estimate Vector's value over the life of the company's assets and cash flows. This requires a long-term estimate of the post-tax WACC, while the IM seeks to estimate Vector's post-tax WACC for the term of each regulatory period. Accordingly the broker reports use a longer risk-free rate (10 years), typically averaged over a long period, rather than a specified shorter period so as to best match the risk-free rate for the regulatory period. When interest rates are relatively low, the WACC under the IM will be lower than the broker estimates, but at other times it can be expected to be greater.¹³¹⁸

H13.55 Given those two contextual factors, the Commission considers the broker estimates of Vector's post-tax WACC generally support the reasonableness of the estimates produced using the IM, and therefore support a conclusion that the IM will produce estimates of the post-tax WACC that are commercially realistic.

¹³¹⁶ PricewaterhouseCoopers, *The Cost of Capital Report*, June 2010, p. 2.

¹³¹⁷ UBS estimates a Vector electricity cost of capital of 7.7% versus its estimate of Vector's company-wide cost of capital of 8.2%.

¹³¹⁸ This point is explicitly noted by some brokers, see paragraph H13.56.

- H13.56 The New Zealand Treasury commissioned two New Zealand investment banks (Forsyth Barr and First NZ Capital) to prepare separate valuations of Transpower. Their valuations were publicly released in December 2010, and include estimates of the post-tax WACC for Transpower of 7.2% (Forsyth Barr) and 7.35% (First NZ Capital).¹³¹⁹ Like the broker reports on Vector the Transpower valuation reports estimate the long-term value of Transpower and therefore use an estimate of the long-term cost of capital. In light of the banks' view that the risk-free rate will trend higher, the Transpower valuation reports use estimates of the risk-free rate which are above current market risk-free rates.¹³²⁰ Both valuations note that the IM provides for the WACC to be updated to reflect changed interest rates for Transpower's next regulatory period. Indeed, Forsyth Barr's estimate is that the post-tax WACC estimated under the IM for the regulatory period from 2015/16 to 2019/20 will be higher than Forsyth Barr's estimate of Transpower's WACC (due to its expectation that interest rates will rise).¹³²¹
- H13.57 The closeness of these independent estimates of Transpower's WACC to the IM estimates supports the reasonableness of the cost of capital IM for Transpower. Further, as Transpower has a relatively small non-regulated business, (for example, as compared with Vector) the estimates provided by First NZ Capital and Forsyth Barr are a good indication of long-term cost of capital for a pure-play EDB (unlike the estimates of Vector's overall cost of capital). As such, they provide support also for the reasonableness of the cost of capital IM for EDBs (since the systematic risk of both is considered to be similar).
- H13.58 The NZ Airways Corporation, like the EDBs, is a monopoly provider of essential services through its Air Navigation Service (ANS). The Airways Corporation estimates the ANS' post-tax WACC at 5.9% (Pricing Proposal June 2009). This is below the Commission's estimate of the post-tax WACC for EDBs, which could suggest the Commission's IM may be generous in favour of regulated suppliers.
- H13.59 The independent post-tax WACC estimates for NZ monopoly suppliers are summarised in Table H27 below. The estimates produced via the IM are within the range of estimates made by independent parties range for EDBs and comparable New Zealand monopoly providers of essential services.

¹³¹⁹ Forsyth Barr, *Transpower - Powering up*, 5 November 2010, p. 5. First NZ Capital, *Transpower – A valuation perspective*, 29 October 2010, p. 14.

¹³²⁰ Forsyth Barr, *Transpower - Powering up*, 5 November 2010, p. 5. First NZ Capital, *Transpower – A valuation perspective*, 29 October 2010, p. 14.

¹³²¹ Using parameters from the Draft IMs, Forsyth Barr estimated a post-tax WACC of 7.8% at the 75th percentile for the period 2015/16 to 2019/20 and a post-tax WACC of 7.1% at the 75th percentile for the period 2011/12 to 2014/15.

Table H27 Independent Estimates of Post-tax WACCs for NZ Monopolies

Approach	Post-tax WACC Estimate
PwC estimate for Horizon Distribution (an EDB, June 2010)	6.2%
PwC estimate for Vector Limited (June 2010)	6.5%
NZ Broker estimates for Vector (Aug-Sept 2010)	7.35%-8.5% Average 8.0%
NZ Broker estimates for Transpower (Oct-Nov 2010)	7.2%-7.35% Average 7.3%
Airways Corporation Air Navigation Service	5.9%
Estimate of the post-tax WACC for an EDB / Transpower (at the 50th percentile as at September 2010)	6.5%
Estimate of the post-tax WACC for an EDB / Transpower (at the 75th percentile as at September 2010)	7.2%

Testing reasonableness using other models

H13.60 Professor Myers and Professor Franks recommended the Commission estimate WACC using the classical CAPM. While not favoured by submissions, and not included in the IM, this can test the reasonableness of the results from the simplified Brennan-Lally CAPM.

H13.61 Using the same data as set out in Table H22 and an MRP of 5.8%, the classical CAPM produced a mid-point post-tax WACC of 6.8%. For the simplified Brennan-Lally CAPM the IM provides for a 75th percentile estimate of the WACC for application for DPPs and CPPs. The 75th percentile estimate of the post-tax WACC is 7.5% under the classical CAPM.

H13.62 The simplified Brennan-Lally CAPM results in post-tax WACC estimates which are approximately 0.3% below those resulting from an application of the classical CAPM. This is to be expected as the Classical CAPM assumes all forms of investment income are taxed at the same rate (e.g. it ignores the value of imputation credits and treats all capital gains as being taxed at 28%).

H13.63 Professors Myers and Franks recommended the use of the Fama-French three-factor model and the DCF model as reasonableness checks for CAPM estimates, “provided that necessary data are available and that the model’s assumptions are reasonably satisfied”.¹³²² However, there is very little New Zealand data available to robustly estimate a cost of equity using these methods and the no submission provided estimates of the cost of equity in New Zealand using either of these models. Accordingly, it is not practical to use these models as reasonableness tests in a New Zealand context.

¹³²² Franks, J., Lally M., & Myers S., *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, 2008, p. 8.

H13.64 Professor Franks also recommended the use of the international CAPM. This would require estimates of the MRP appropriate to international investors, and the estimation of the relative riskiness of NZ regulated suppliers to an internationally diversified investor (i.e. beta). Such data is not readily available, and therefore the international CAPM cannot be readily or reliably used. As discussed in paragraphs 6.4.33 to 6.4.35, the best view of the estimates of the cost of equity from an international investor’s perspective is that it is likely to be at or below the level estimated from a domestic investor’s perspective.

H13.65 Table H28 below summarises the estimates of post-tax WACC for EDBs using methods and approaches other than those specified in the IM. The estimates produced via the other approaches are close to those estimated using the simplified Brennan-Lally CAPM (with leverage of 44% and no debt beta).

Table H28 Estimated WACCs using other models and approaches to estimate the cost of equity

Approach	Post-tax WACC Estimate
EDB WACC estimated using the classical CAPM (50th percentile)	6.8%
EDB WACC estimated using the classical CAPM (75th percentile)	7.5%
EDB WACC estimated using Fama French and dividend growth model	Not practical
EDB WACC estimated using International CAPM	Not practical but evidence suggests it is lower than domestic CAPM estimate
Commission’s estimate of the post-tax WACC for an EDB / Transpower (at the 50th percentile as at September 2010)	6.5%
Commission’s estimate of the post-tax WACC for an EDB / Transpower (at the 75th percentile as at September 2010)	7.2%

Conclusions – reasonableness of WACC estimates for EDBs

H13.66 Figure H14 below summarises the information outlined above to test the reasonableness of the post-tax WACC estimated under the IM as at September 2010.

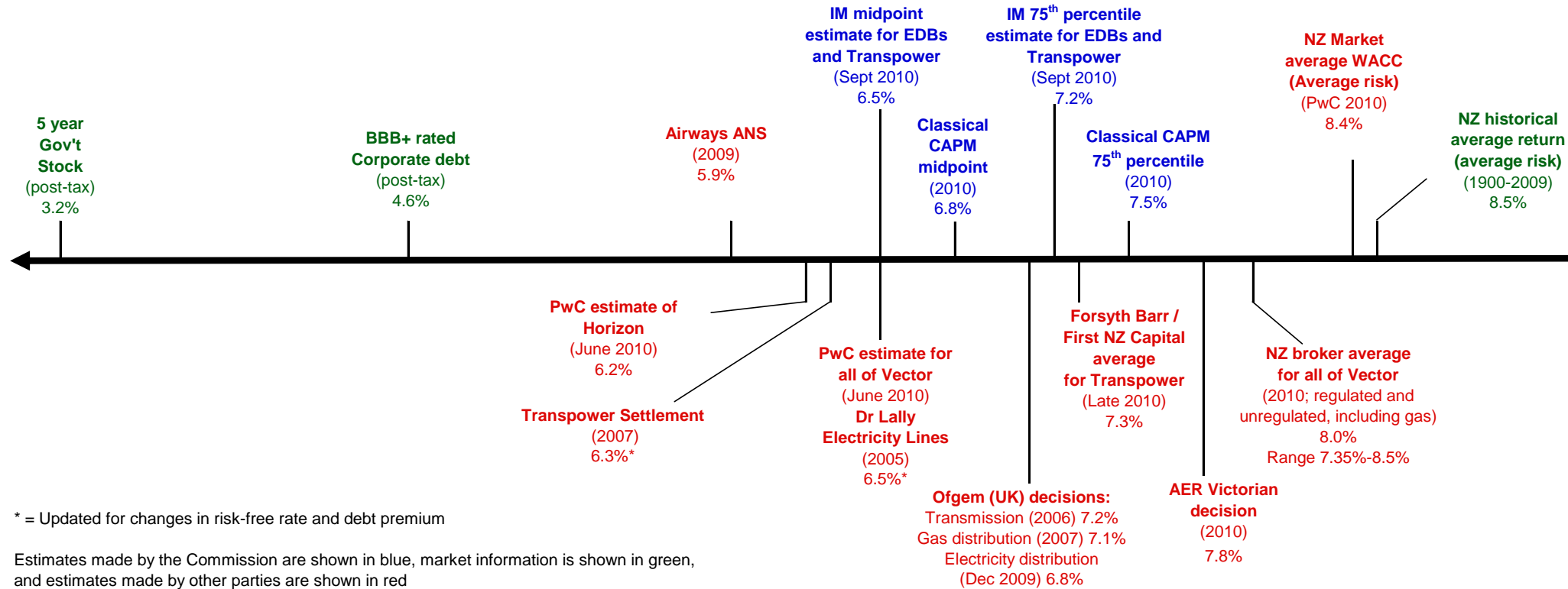
H13.67 The IM estimate of the post-tax WACC falls within the range of the comparative information. The 75th percentile estimate is above estimates from some other sources, notably PwC’s estimates for Vector and Horizon’s post-tax WACC, and Airway’s estimate of the post-tax WACC for its monopoly essential service. It is in line with the independent estimates by First NZ Capital and Forsyth Barr used recently to value Transpower, but below the broker average long-term post-tax WACC for all of the Vector group (which includes a regulated gas business as well as other unregulated businesses). The estimate produced under the IM for application to DPPs and CPPs is close to the implied, post-tax WACC estimates used by Ofgem for price-setting in the UK electricity and gas sectors.

H13.68 The Commission’s estimate of the post-tax WACC is below the historical estimates of the New Zealand market (an investment with average risk), and the expected

return for a New Zealand investment of average risk, as would be expected in respect of a regulated business of low relative risk, but comfortably above the post-tax cost of corporate debt.

- H13.69 The IM's post-tax WACC is below that of the AER. The Commission has considered carefully the differences between its approach and that of the AER, and notes that part of the differences in post-tax WACC estimates is due to differences in taxation regimes and monetary conditions that reflect fundamental characteristics of the business environment which are outside the scope of regulatory decisions. Other differences between the IM and AER were in dealing with uncertainty in estimating the cost of equity – where the Commission's approach is more favourable to suppliers, and the term of the risk-free rate where the Commission prefers its approach to that currently adopted by the AER.
- H13.70 In summary, this information, considered individually and as a whole, strongly supports the conclusion that the IM produces reasonable and commercially realistic estimates of the post-tax WACC for New Zealand EDBs and Transpower.

Figure H14 Summary of information considered in reasonableness tests



Reasonableness of IM WACC for GPBs

H13.71 The above discussion has concentrated on electricity lines services. The reasonableness of the post-tax WACC estimates in relation to GPBs under the cost of capital IM is now considered.

H13.72 New Zealand GPBs likely face greater systematic risks than suppliers of electricity lines businesses. Therefore, for the reasons set out in the asset beta section, the IM adopts a higher equity beta for GPBs. The practical consequence of this is that GPBs will have a higher post-tax WACC than electricity lines businesses for the same regulatory period (even assuming the same risk-free rate and debt premium).

H13.73 There is little information available to test the reasonableness of this approach. Indeed, the evidence that does exist suggests a similar equity beta and WACC that would normally be assumed for GPBs and EDBs. The Commission notes this evidence all relates to contexts outside of New Zealand. For example:

- the AER uses the same approach and equity beta for gas distribution companies as for electricity distribution businesses and uses WACC estimates that are very close for electricity and gas;¹³²³
- Ofgem's estimate of the WACC for gas distribution companies is very similar to that for electricity distribution companies;¹³²⁴
- the Commission's empirical estimates of the asset beta produced an asset beta that was lower, not higher, for predominantly gas companies than for predominantly electricity companies;¹³²⁵ and
- NERA note that the regulated equity premium for US electricity utilities was identical to that for US gas utilities over the past period 1996-2010.¹³²⁶

H13.74 In light of this information, the IM may be considered favourable to GPBs. The Commission's approach to developing the IM is not mechanistic and, on balance, the Commission considers that there are good reasons in theory to consider that New Zealand GPBs face greater systematic risks than EDBs, and this justifies a higher beta, and therefore a higher WACC.

Comments on reasonableness discussions in submissions

H13.75 Some submissions included a discussion of reasonableness and comparative information on the WACC. These submissions included a submission from Cameron Partners on behalf of Transpower¹³²⁷ and an analysis of equity premiums

¹³²³ See for instance: AER, *Jemena Gas Networks Access arrangement proposal for the NSW gas networks 1 July 2010 – 30 June 2015, Final decision*, June 2010. AER, *Victorian electricity distribution network service providers, Distribution determination 2011-2015, Final decision*, October 2010, p. 484. The two substantive differences between the WACC estimates in these reports relates to the prevailing risk-free rate and debt premium used in the analysis.

¹³²⁴ See paragraph H13.31. Ofgem, *Electricity Distribution Price Control Review Final Proposals*, 7 December 2009. Ofgem, *Gas Distribution Price Control Review*, 3 December 2007.

¹³²⁵ See the asset and equity beta appendix.

¹³²⁶ Orion New Zealand Ltd, *Cross Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper*, Attachment: NERA, *The Cost of Equity: a report prepared for Orion New Zealand Ltd*, 2 September 2010, footnote 27.

¹³²⁷ Cameron Partners, *Report to Transpower New Zealand Limited Relating to a market based rate of return assessment*, 16 August 2010.

in US rate-setting cases. Comments on the use of data from US regulatory decisions and on the submission of Cameron Partners (for Transpower) are outlined below.

H13.76 Typically these submissions concentrated on US data or headline comparisons with Australian data, and did not discuss or acknowledge relevant New Zealand comparative information. For example, none of these submissions discuss or acknowledge the reasonableness information outlined above, and in particular the New Zealand estimates of post-tax WACC.

The Submission of Cameron Partners

H13.77 Cameron Partners (on behalf of Transpower) submitted that use of the IM did not produce reasonable estimates of the WACC.¹³²⁸ The Cameron Partners submission did not seek to critique the Commission's methodology; rather it sought to use market benchmarks, published market analysis, and interviews to estimate the market rate of return for a company like Transpower. Based on this work, Cameron Partners concluded that the firm-wide rate of return for Transpower would range from 8.2% to 9.2% with an average of 8.7%.

H13.78 There are a number of issues with the Cameron Partners' approach and analysis which, in the Commission's view, largely undermine the estimates reported by Cameron Partners. These issues are outlined below.

H13.79 The Cameron Partners submission assumes an average cost of debt of between 7.4% and 8.4% (which is well above current market interest rates for corporate debt) on the basis that interest rates may trend higher as the economic recovery occurs. No explanation is provided for how this estimate was made. More fundamentally, however, it is not clear why consumers should bear a higher interest rate than the market rates when regulated firms can lock in the prevailing (lower) rates of interest. The higher than current interest rate assumed by Cameron Partners biases upwards its estimate of the return required by investors.

H13.80 While the Cameron Partners submission assumes interest rates will rise in future, it does not acknowledge that the IM provides for future estimates of WACC to reflect subsequent changes in interest rates and debt premiums. This point is acknowledged by other advisors.¹³²⁹

H13.81 The Cameron Partners submission assumes, based on prior market transactions in New Zealand and Australia, that the market value for regulated firms is greater than the RAB values determined under regulation. However, Cameron Partners fail to acknowledge that by paying a price for a regulated asset that is above its RAB value, investors indicate their apparent willingness to accept lower returns than the regulator is allowing. That is, by paying more than the RAB, the investor will earn a return that is lower than the regulated WACC on those RAB values. In short, the evidence submitted by Cameron Partners on the prices paid relative to RAB for

¹³²⁸ *ibid.*

¹³²⁹ See for example, Forsyth Barr, *Transpower - Powering up*, 5 November 2010, at p. 3 who estimate the Commission's WACC for the 2015/16-2019/20 regulatory period will be 70 basis points higher than in the initial regulatory period due to Forsyth Barr's forecast of a rise in interest rates (partly offset by their assumption of a decline in debt premiums). And First NZ Capital, *Transpower – A valuation perspective*, 29 October 2010, p. 15, which assumes the WACC increases by 0.3% in the regulatory period commencing in 2015.

regulated firms, implies the regulated WACC in Australia and New Zealand has typically been too favourable to regulated suppliers.

- H13.82 The Cameron Partners submission relies on a single Australian broker report on the estimated required rate of return for infrastructure firms. No reference is made to New Zealand broker estimates of the cost of equity and the WACC for regulated and/or infrastructure firms (which the Commission understands are lower than the Australian estimates referenced in the Cameron Partners submission), even though Cameron Partners quotes such reports in support of other points made in its submission. The use of this Australian data biases upwards its estimate of the cost of equity for New Zealand EDBs.
- H13.83 The Cameron Partners submission relies on a confidential discussion with a single fund manager and an analyst for the view that the required rate of return on equity is between 11 and 13%. The basis for determining this very small sample is not stated, and cannot be replicated since the participants are not identified. Further, Cameron Partners took the view expressed by the fund manager and analyst on the expected return on equity (10-12%) and add a further 1% (to 11-13%) without sufficiently justifying that this is appropriate and does not double-count for any factors already considered by the fund manager and analyst. Finally, it is not clear whether the expressed view on returns are updated to reflect the current reality of lower global economic growth, lower interest rates, and lowered return expectations. The practical result of this approach is likely to bias upwards the estimated cost of equity.¹³³⁰
- H13.84 Due to these and other issues, the Commission considers that little weight can be placed upon the Cameron Partners submission. In particular, the Cameron Partners submission does not provide any substantial unbiased insight into the reasonableness of the WACC produced by the IM. Instead, the Commission has relied on its own reasonableness tests described above.

Comparison with US results

- H13.85 NERA (for Orion) and CEG (for Vector) both compare the cost of equity implied under the draft IM, with the return on equity set in US rate-setting cases. They conclude that the IM produces an equity premium (the cost of equity less the risk-free rate) that is too low relative to that allowed in US decisions.¹³³¹
- H13.86 CEG's analysis focuses on equity premiums in US regulatory decisions since 2009 and states that the US equity premium averages 8.1%. CEG submit that this is more than twice the 75th percentile estimate provided using the IM and submits that the

¹³³⁰ Further, it is not close to the independent estimates of two investment banks who estimated Transpower's long-run post-tax WACC at 7.35% (First NZ Capital) and 7.2% (Forsyth Barr). See First NZ Capital, *Transpower – A valuation perspective*, 29 October 2010, p. 14. Forsyth Barr, *Transpower - Powering up*, 5 November 2010, p. 5.

¹³³¹ Orion New Zealand Ltd, *Cross Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper*, Attachment: NERA, *The Cost of Equity: a report prepared for Orion New Zealand Ltd*, 2 September 2010, pp. 20-22; Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 37-39.

“Commission’s point estimate is a biased estimate and is well understood to be biased even by the Commission.”¹³³²

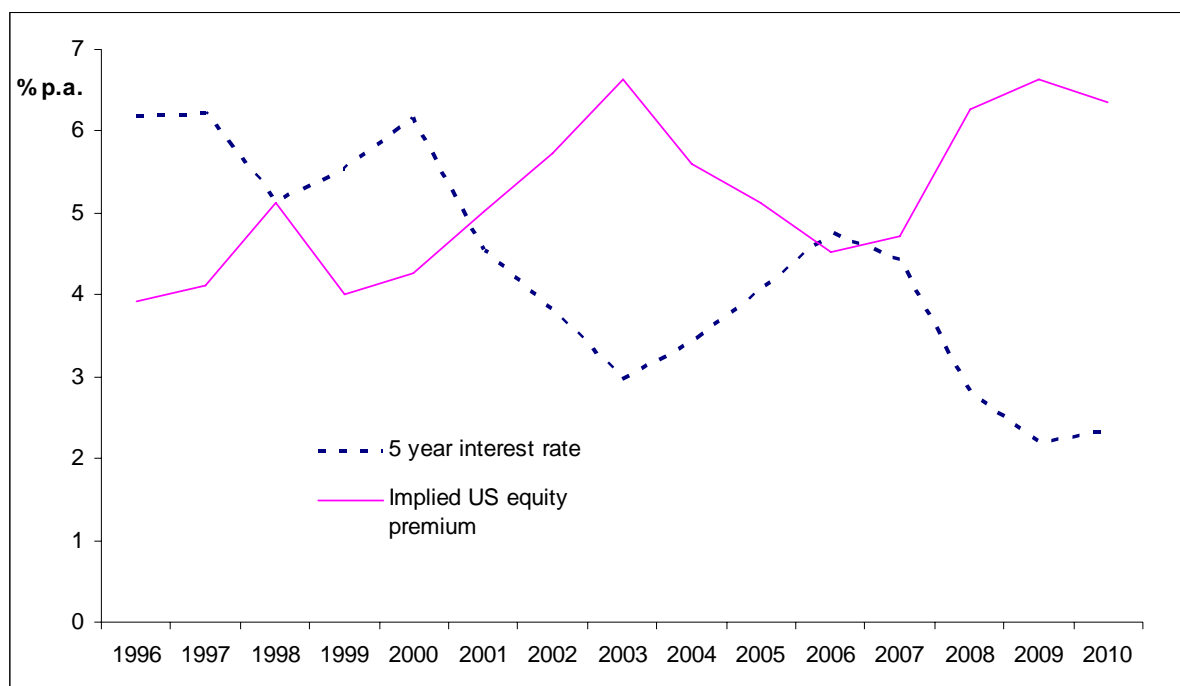
- H13.87 The Commission does not accept that its estimate of the equity premium is biased, and it rejects the assertion that it understands the estimate to be biased. Rather, the clear conclusion from the reasonableness tests above is that the estimate of the overall WACC (including the cost of equity) produced under the IM is reasonable and commercially realistic.
- H13.88 The Commission has identified two key concerns with CEG’s analysis of implied US equity premiums in rate-setting cases.
- H13.89 First, CEG’s analysis ignores the very different approaches to estimating the cost of capital in practice adopted in the US compared to that in New Zealand. The New Zealand approach is to link explicitly the WACC to current interest rates. This results in greater variations of the estimate of the WACC in New Zealand, which are a direct and full reflection of the volatility of domestic interest rates.
- H13.90 In contrast, the US regulatory approach buffers US regulated firms from the full impact of changes in interest rates. This reflects the substantial discretion exercised by US rate-setters, and the reliance in the US on the dividend growth model to estimate the cost of equity.¹³³³ Under this approach the implied equity premium increases as interest rates fall, and vice versa. This is illustrated in Figure H15 below of US equity premiums in regulatory decisions from 1996 to 2010 and the US five-year interest rate over this period.¹³³⁴

¹³³² Vector Limited, *Submission in response to the Commerce Commission’s Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, 15 August 2010, p. 38.

¹³³³ Some US (and Canadian) rate-setters also have a policy of not passing on the full impact of changes in interest rates onto regulated firms through their regulated rates of return. (See California Public Utilities Commission, Decision 00-12-062 December 21, 2000, re: Sierra Pacific Power Company).

¹³³⁴ The data depicted in Figure H15 was submitted by NERA on behalf of Orion. Orion New Zealand Ltd, *Cross Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper*, Attachment: NERA, *The Cost of Equity: a report prepared for Orion New Zealand Ltd*, 2 September 2010, p. 21.

Figure H15 US interest rates and the implied US equity premium in rate-setting cases



H13.91 The graph clearly illustrates that the implied US equity premium assumed under regulation is currently at historically high levels, whilst US interest rates are at very low levels of around 2%.¹³³⁵

H13.92 CEG’s analysis looks only at the implied equity premium since 2009, a period when US interest rates were at their lowest and US regulatory equity premiums at their highest. At other points in time, when US interest rates were higher, the implied US equity premium was much smaller (in 2000 it was 4%, approximately half the level estimated by CEG). Through its selection of an unrepresentative time period of analysis, CEG’s analysis is biased.

H13.93 A second issue with CEG’s analysis is that it makes no adjustment for the higher leverage of the US regulated firms. Higher leverage increases the return on equity, but should not increase the overall WACC (as discussed in Appendix H3 on leverage). The firms in the regulatory decisions identified by CEG had an average leverage of 52%, considerably above the 44% notional assumption specified in the IM.¹³³⁶ This increases the implied US equity premium. A proper comparison between the IM and US levels of implied equity premium would normalise for the different levels of leverage.

¹³³⁵ The graph does not replicate CEG’s estimate of an 8.1% equity premium since CEG’s analysis appears to be based on a different (and inconsistent) leverage assumption. Refer paragraph H13.93.

¹³³⁶ CEG’s submission (on behalf of Vector) suggests the leverage of these firms is around 40%, and seems to rely on the Commission’s work in estimating beta for these firms’ listed parent group in support of this conclusion (see Vector Limited, *Submission in response to the Commerce Commission’s Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010). However, the leverage assumption that was used in each US rate-setting case is stated in each rate-setter’s decision. To ensure consistency with the estimate of the return on equity used in the rate setting case, the estimate of leverage in the rate setting case should be used, rather than an estimate from another source.

H13.94 NERA adjusted for differing levels of leverage and estimated the implied US equity premium over a 15 year period (a long period would tend to average out the impact of periods with high and low interest rates).¹³³⁷ NERA estimated the average US re-levered equity premium in rate-setting cases at 5.39% over the period 1996-2010. NERA noted this was above its estimate of the equity premium under the IM (2.64%).

H13.95 The Commission notes, however, that NERA’s estimate of the implied equity premium under the IM used the mid point estimate of post-tax WACC rather than the 75th percentile estimate. Since the 75th percentile estimate of the post-tax WACC will be used for setting price-quality paths, the Commission considers it is the more appropriate starting point for a comparative analysis with US rate setting cases.

H13.96 Using the parameters specified in Table H22, the equity premium under the IM at the 75th percentile estimate of post-tax WACC is 4.3%. While this is below NERA’s estimate of the US equity premium over the period 1996-2010, it is above that allowed by the AER and Ofgem in their most recent decisions (after adjusting for leverage). This is summarised in Table H29 below.

Table H29 Implied Equity Premiums from Various Regulators at 44% Leverage

Regulatory decision	Implied equity premium
AER Victorian electricity distribution network service providers ¹³³⁸	3.7%
Ofgem average equity premium ¹³³⁹	3.3%
US regulated equity premiums 1996-2010 (NERA analysis) ¹³⁴⁰	5.6%
IM implied equity premium at the 75th percentile	4.3%

H13.97 The US approach to setting the rate of return for regulated firms is very different to the New Zealand approach, with a lesser reliance on formal methodologies in favour of greater discretion by the rate-setter, with cases considered in a more politicised environment. The New Zealand approach has more in common with the Australian and UK approaches and are therefore better comparators for testing the reasonableness of the New Zealand estimates than the US decisions. On balance, this information supports the reasonableness of the IM estimates of the cost of equity when appropriate account is taken of the impact of leverage on the cost of equity.

¹³³⁷ Orion New Zealand Ltd, *Cross Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper*, Attachment: NERA, *The Cost of Equity: a report prepared for Orion New Zealand Ltd*, 2 September 2010, pp. 20-22.

¹³³⁸ AER, *Victorian electricity distribution network service providers, Distribution determination 2011-2015, Final decision*, October 2010, p. 519.

¹³³⁹ Ofgem, *Electricity Distribution Price Control Review Final Proposals – Allowed Revenue and Financial Issues*, 7 December 2009, p. 16. Ofgem, *Gas Distribution Price Control Review Final Proposals (GDPCR)*, 3 December 2007, p. 105. Ofgem, *Transmission Price Control Review Final Proposals*, 4 December 2006, p. 54.

¹³⁴⁰ NERA’s analysis assumed a 40% notional leverage under the IM. 44% is now specified so the Commission has re-estimated NERA’s premium assuming 44% leverage. This increased the re-levered US equity premium to 5.6%.

- H13.98 Finally, the Commission comments on three other cross-checks proposed by CEG. First, CEG submit that the proposed NZ equity premium should be compared against the debt premium on Australian BBB+ rated corporate bonds. CEG submit that the mid-point is less than debt premium on Australian BBB+ rated corporate bonds.¹³⁴¹ However, the analysis takes a post-tax equity premium and compares this against pre-tax bond yields. Making the comparison on a consistent post-tax basis, the NZ equity premium is above the Australian BBB+ bond yield data submitted by CEG.
- H13.99 Second, CEG submit a formula explained by Professor Grundy¹³⁴² for the relationship between the equity risk premium¹³⁴³ and the debt premium.¹³⁴⁴ They observe that at a leverage of 60%, this formula implies that the equity risk premium will be at least 2.67 times the debt premium, and at a leverage of 40% the equity risk premium will be at least 3.5 times the debt premium.¹³⁴⁵
- H13.100 Earlier in its submission, CEG (for Vector) note that from January 2009 to July 2010 regulatory determinations have been made for 31 of the 48 US businesses in the Commission's sample. CEG observe that the average leverage of these US companies as listed in Appendix F of the Draft Reasons Paper was 41%, the average equity risk premium estimated by the US regulators was 8.1% and the average debt premium was 4.0%. CEG also provides data for Australian regulatory determinations over the same period, being notional regulatory leverage of 60% and an average debt premium of 3.4%.¹³⁴⁶
- H13.101 The Australian regulatory determinations referenced by CEG, apart from Queensland Rail, are based on a notional regulatory market risk premium of 6.5% and an equity beta of 0.80, which equates to an equity risk premium of 5.2%.
- H13.102 No evidence has been placed before the Commission that the formula submitted by CEG is widely used.
- H13.103 In addition, the data CEG submitted appears to violate the relationship CEG asserts must exist. For example, using CEG's US data, CEG assert that the equity risk

¹³⁴¹ Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, p. 39.

¹³⁴² Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, 15 August 2010, p. 41.

¹³⁴³ The term 'equity risk premium', as used by CEG, is equivalent to the market risk premium multiplied by the equity beta. References to equity risk premium in this paper are to CEG's definition of this term.

¹³⁴⁴ Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, p. 41.

¹³⁴⁵ Presumably, consistent with theory, CEG is referring to the expected debt premium, which will be lower than the observable promised debt premium. CEG are silent on whether their analysis uses expected debt premiums or observed promised debt premium.

¹³⁴⁶ Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, pp. 37, 40-42.

premium must be at least 14.0% (3.5 x 4.0%),¹³⁴⁷ whereas on CEG's own analysis US regulators estimated the average equity risk premium at 8.1%. Likewise, using CEG's Australian data, CEG assert that the equity risk premium must be at least 9.1% (2.67 x 3.4%),¹³⁴⁸ whereas Australian regulators used an implied equity risk premium of 5.2%. In sum, the CEG cross-check does not explain the relationship between US debt and equity premiums for a given level of leverage, nor the Australian data that was submitted by CEG.

H13.104 CEG submit that the reason for this is that the true risk free rate is above the government bond rate (which is widely used by practitioners and regulators as the proxy for the risk free rate).¹³⁴⁹ It is implicit from the determinations of the regulators quoted by CEG that none of the regulators support CEG's contention.

H13.105 The third additional cross-check CEG (for Vector) propose is the use of the Fama French three-factor model as a test of the results of the simplified Brennan-Lally CAPM used in the IM. In particular, CEG refer to NERA reports that were submitted to Australian regulators. No data specific to New Zealand was submitted. Rather, CEG compare NERA's Australian estimates against the IM mid-point estimate.

H13.106 In summary, the Commission does not accept the NERA estimates highlighted by CEG are a valid reasonableness test. First, CEG's approach overlooks any differences that may exist between New Zealand and Australia, for example the different leverage assumptions which will increase the NERA cost of equity, vis-à-vis the IM estimates. Adjustment for leverage differences is required to ensure a valid comparison with estimates produced using the IM. Second, CEG's submission uses the IM's midpoint estimate, when a more appropriate comparison would be the 75th percentile estimate (as both the NERA and IM estimates are to be used for price-setting). Third, the CEG submission does not address the significant issues and challenges identified by the AER in using the Fama-French model to estimate the cost of equity. The AER's conclusions in this regard are summarised above in paragraph H2.26. The Commission does not therefore consider any reliance can be placed on the Australian information from the Fama-French three-factor model that was submitted to the Commission.

¹³⁴⁷ Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, 15 August 2010, p. 42.

¹³⁴⁸ Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, 15 August 2010, p. 41.

¹³⁴⁹ Vector Limited, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost of Capital*, Attachment: Competition Economists Group, *Cost of Capital Input Methodologies: a report prepared for Vector Limited*, 15 August 2010, 15 August 2010, p. 42.

H14 Application of the Cost of Capital IM

Information disclosure

H14.1 The cost of capital IM comprises the WACC and an allowance for the term credit spread differential.

H14.2 The first component is the WACC. The IM requires the vanilla and post-tax WACC for EDBs and GPBs to be estimated as follows:

- the values of leverage, the tax-adjusted market risk premium, betas, and debt issuance costs are fixed in the IM Determination and will not be updated;
- corporate tax rates are linked to the prevailing rate of company tax rates as set by legislation;
- the investor tax rate is linked to the maximum prevailing rate of the prescribed investor rate as set by legislation;
- the WACC is estimated over a period of five years.
- the Commission's estimates of the risk-free rate and the debt premium will be for a five-year period. The Commission will update the estimates of the risk-free rate of return and the debt premium annually for each WACC estimation;
- the methodology for estimating the risk-free rate and the debt premium estimates is set out in the IM Determination. This methodology makes explicit allowance for the small number of New Zealand bonds that are publicly traded;
- the WACC estimates for EDBs for information disclosure (regardless of whether these are exempt or non-exempt from default/customised price-quality regulation) will be calculated by the Commission within one month of the start of the disclosure year in question;
- the WACC estimates for GPBs for information disclosure will be calculated by the Commission within one month of the start of the disclosure year in question; and
- the Commission will publish its annual estimates within one month of having made the estimate.

H14.3 The second component is the term credit spread differential. Suppliers of regulated services can calculate and disclose the amount of the term credit spread differential (including the costs of entering an interest rate swap) in respect of debt issues with a term which exceeds five years where the supplier's overall debt portfolio has an original tenor which exceeds five years. This is a separate allowance and is not part of the WACC.

H14.4 The Commission's estimates will be in the form of a WACC range for each of the vanilla and post-tax WACC. In the case of EDBs and GPBs, this range will be from the 25th to 75th percentile. The WACC ranges will be estimated in accordance with the methodology set out in the IM Determination.

Default/customised price-quality regulation

DPPs

H14.5 For the purposes of DPPs, the IM requires the Commission to estimate EDBs and GPBs' vanilla WACC when required as follows:

- for the purposes of DPPs, the Commission will apply the same methodology for calculating the vanilla WACC as estimated for EDBs and GPBs for information disclosure purposes;
- for EDBs the vanilla WACC will be calculated as at the first working day of the month seven months prior to the start of the first year of the DPP regulatory period;
- for GPBs the vanilla WACC will be calculated as at the first working day of the month seven months prior to the start of the first year of the DPP regulatory period;
- the Commission will select a single point estimate for the purposes of default price-quality path regulation. This point estimate will be the 75th percentile estimate of WACC; and
- for the purpose of making adjustments to EDBs' and GPBs' DPP starting price, the Commission will apply the vanilla WACC 75th percentile estimate in its assessment of an appropriate adjustment to EDBs' and GPBs' DPP starting price.

CPPs

H14.6 For the purposes of CPPs, the IM requires the Commission to estimate EDBs' and GPBs' vanilla WACC when required as follows:

- the values of leverage, the tax-adjusted market risk premium, betas, debt issuance costs are fixed in the IM Determination and will not be updated;
- the investor tax rate is linked to the maximum prevailing rate of the prescribed investor rate as set by legislation;
- the WACC is estimated over a period of three, four and five years commencing on the first day of the month seven months prior to the start of the disclosure year in question;
- the Commission's estimates of the risk-free rate and the debt premium will be for a three, four and five-year period. The Commission will update the estimates of the risk-free rate and the debt premium annually for each WACC estimation;

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- the methodology for estimating the risk-free rate and the debt premium estimates is set out in the IM Determination. This methodology makes explicit allowance for the small number of New Zealand bonds that are publicly traded; and
 - the Commission will publish its annual estimates within one month of making the estimate.
- H14.7 The term credit spread differential is a separate allowance and is not part of the WACC. Suppliers can calculate and disclose the amount of the term credit spread differential (including the costs of entering an interest rate swap) in respect of a debt issue with a term which exceeds five years where the supplier's overall debt portfolio has an original tenor which exceeds five years.
- H14.8 The Commission's WACC estimate for the purpose of CPPs will be the point estimate at the 75th percentile of the WACC range. The 75th percentile estimate of the WACC will be estimated in accordance with the methodology set out in the IM Determination.
- H14.9 The WACC estimates for EDBs that apply for a CPP will be calculated as at the first working day of September the year preceding the regulatory period (i.e. 19 months in advance).
- H14.10 GPBs that apply for a CPP should use the Commission's most recent published estimate of the WACC relevant to GPBs.
- H14.11 The Commission will publish its WACC estimate no later than one month after the estimation date. This will allow suppliers four months between the publication of the WACC and the deadline for the CPP application.

Use of forward starting rates

- H14.12 The Commission recognises that, due to the lag between estimating the WACC for CPP and the start date of the CPP regulatory period, the WACC estimate will be 19 months out of date by the time the CPP regulatory period commences. The Commission's Draft Reasons Paper invited comments on which of three options articulated in that paper was the preferred option of dealing with this lag.
- H14.13 While most submissions did not discuss this issue, a small number of submissions did. These favoured the forward starting risk free rate.
- H14.14 The Commission recognises that the use of forward starting interest free rates is a technically superior way of allowing for the impacts of this lag, than the use of spot rates. However, for the following reasons, the IM uses spot rates and does not incorporate the use of forward starting risk-free rates.
- The use of forward starting risk-free rates would introduce additional complexity into the Determination and the process of estimating the risk-free rate.
 - There is no *ex ante* reason to expect that use of spot rates will systematically bias the estimate of the WACC upwards or downwards.

- There is no accepted methodology for estimating a forward starting risk-free rate.
- It is not apparent that there is any additional benefit from the use of forward starting rates that would offset the additional complexity resulting from their use.

H14.15 For these reasons, the Commission retains its preference as expressed in the draft reasons paper in favour of the use of spot rates and the IM is drafted accordingly.

APPENDIX I: PRICING METHODOLOGIES

I1 Application to CPPs

Introduction

- I1.1 In deciding whether to apply the IM to CPPs, the Commission considered whether the benefits (in terms of improvements in allocative efficiency) were likely to be sufficient to justify the costs of applying the IM.
- I1.2 Vector supported applying the IM to CPPs where the Commission has identified issues under information disclosure.¹³⁵⁰ Greymouth Gas and MEUG submitted that pricing methodologies should apply to CPPs.¹³⁵¹ GasNet submitted that pricing methodologies would likely form part of supplier's proposal for a CPP in most (but not all) circumstances.¹³⁵² Mighty River Power was "sceptical about how effective information disclosure could be in terms of improving network utility pricing arrangements."¹³⁵³
- I1.3 While the IM will apply to CPPs, the Commission has carefully considered the appropriate extent of its involvement in approving pricing methodologies, in order to maximise the net benefits of the principles-based approach.¹³⁵⁴ In order to ensure cost-effectiveness, the information on pricing methodologies required in a CPP proposal will be the same type of information that is required for information disclosure purposes and independent verification of the proposed pricing methodology will not be required.

Differences in approach to DPPs and CPPs

- I1.4 Mighty River Power and Contact Energy argued that there should be a consistent approach to DPPs and CPPs and that applying an IM for pricing methodologies to CPPs (but not to DPPs) may inhibit investment incentives.¹³⁵⁵ Mighty River Power submitted:¹³⁵⁶

If a pricing input methodology is adopted for [CPPs], while none is provided for [DPPs], this would impose an unnecessary hurdle/barrier to regulated businesses

¹³⁵⁰ Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 51, paragraph 196.

¹³⁵¹ Greymouth Gas Limited, *Post-Workshop Submission on the Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Emerging Views Paper*, 15 March 2010, p. 4 and p. 11; Major Electricity Users' Group, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, Appendix, p. 2.

¹³⁵² GasNet Limited, *Submission on the Input Methodologies Discussion Paper*, 7 August 2009, p. 7, paragraph 27.

¹³⁵³ Mighty River Power, *Submission on the Input Methodologies Discussion Paper and the Default Price-Quality Paths for Electricity Distribution Businesses' Discussion Paper*, 29 July 2009, p. 7, paragraph 36.

¹³⁵⁴ In determining the appropriate extent of its involvement, the Commission considered the views of Powerco and Vector (as well as its own experience) under the Gas Authorisation.

¹³⁵⁵ Contact Energy Limited, *Submission on the Input Methodologies Discussion Paper*, 31 July 2009, p. 3; and Mighty River Power, *Submission on the Input Methodologies Discussion Paper and the Default Price-Quality Paths for Electricity Distribution Businesses' Discussion Paper*, 29 July 2009, p. 6, paragraphs 29-31 and p. 7, paragraph 33.

¹³⁵⁶ Mighty River Power, *Submission on the Input Methodologies Discussion Paper and the Default Price-Quality Paths for Electricity Distribution Businesses' Discussion Paper*, 29 July 2009, p. 7, paragraph 33.

seeking a [CPP]. This could ultimately prove to be a barrier to adequate investment where a regulated business seeks a [CPP] because the default does not enable it to make adequate investment, which is likely to be the main reasons for [CPP] applications.

- I1.5 The Commission considers that applying the IM to CPPs (but not to DPPs) will not reduce investment incentives. A supplier can avoid having to submit its pricing methodology as part of its CPP proposal if it can demonstrate (through information disclosure) that its pricing methodology is consistent with the pricing principles and promotes the Part 4 Purpose.
- I1.6 Mighty River Power also argued that there were no grounds for believing that there are greater concerns about the pricing of those that seek CPPs.¹³⁵⁷ However, suppliers will only be required to include a pricing methodology in their CPP proposals in limited circumstances, i.e. where a concern has been identified.

Criteria for requiring a pricing methodology

- I1.7 Vector submitted that the IM should set out criteria explaining when and why pricing methodologies will be required in a CPP proposal in order to promote certainty. Furthermore, it submitted that suppliers should only be required to submit their pricing methodology in instances of significant non-compliance with the pricing principles (noting that an assessment against the principles is inherently subjective and the principles have competing objectives) and where they have had a chance to remedy concerns.¹³⁵⁸
- I1.8 The Commission's summary and analysis may identify issues that require addressing if a CPP proposal were to be lodged, despite the disclosed pricing methodology being consistent with the pricing principles. The Commission considers that it is not possible to set specific criteria for explaining when and why pricing methodologies will be required in the IM.

Commission's discretion to set alternative pricing methodologies

- I1.9 Where a GPB is required to submit its pricing methodology as part of its CPP proposal, the Commission must determine a pricing methodology that is consistent with the pricing principles.
- I1.10 Vector and Powerco submitted that this gives the Commission too much discretion to substitute its own pricing methodology or amend the supplier's proposed pricing methodology if it better met the Part 4 Purpose.¹³⁵⁹ Vector submitted that the

¹³⁵⁷ Mighty River Power, *Submission on the Input Methodologies Discussion Paper and the Default Price-Quality Paths for Electricity Distribution Businesses' Discussion Paper*, 29 July 2009, p. 6, paragraphs 29-31.

¹³⁵⁸ Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 7 & pp. 51-52; Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 6, paragraph 20(c) and pp. 40-41, paragraphs 154-158.

¹³⁵⁹ Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 52, paragraph 200; Powerco Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, pp. 33-34, paragraphs 123-126.

Commission should accept a GPB's proposed pricing methodology if it has shown regard to and consistency with the pricing principles.¹³⁶⁰

I1.11 The Commission considers that the IM will provide suppliers with sufficient certainty because:

- the Commission is constrained to setting a pricing methodology that is consistent with the pricing principles; and
- once a pricing methodology is determined, the Commission can only amend that pricing methodology if the GPB is proposing to make a material change to it (as discussed below).

Amendments to a pricing methodology during the regulatory period

I1.12 Vector submitted that the annual review process should only be required where the GPB is proposing to make a material change to the pricing methodology that has been determined or the Commission has determined a transitional pricing methodology.¹³⁶¹

I1.13 Due to the nature of pricing methodologies, it is difficult to specify upfront when a change is likely to be material enough to warrant the Commission's approval. The Commission will instead be required to exercise its judgement on a case-by-case basis. Therefore, GPBs will be required to submit pricing methodology information in each year of the CPP regulatory period except the last year (because the information provided will relate to the next regulatory year and the supplier may be subject to a DPP or a new CPP in that year).

I1.14 However, where a pricing methodology has already been approved by the Commission as part of determining a CPP, the already-approved pricing methodology will remain in place except if a supplier is proposing a material change to that pricing methodology.¹³⁶² If a material change is proposed, the Commission may make amendments to the pricing methodology although any changes must be consistent with the pricing principles or be a transitional pricing methodology.

¹³⁶⁰ Vector Limited, *Submission on the Draft Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 7 and p. 52.

¹³⁶¹ Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 6, paragraph 20(c), p. 40, paragraph 154 and p. 41, paragraphs 159-162.

¹³⁶² However, the Commission will accept any supplier proposed changes that it determines are not material.

APPENDIX J: RULES AND PROCESSES

J1 Introduction

J1.1 Chapter 8 discusses the key features of the rules and processes IMs. This Appendix provides further detail and responses to submissions on the components of the rules and processes IMs.

J2 Specification of Price under Part 4

Introduction

J2.1 The components of the specification of price IM that are discussed in this Appendix are:

- the definition of price(s);
- the proportion of pass-through costs and recoverable costs that can be passed through to consumers;
- the circumstances in which additional costs (other than those already listed as pass-through costs in the IM) can be included as pass-through costs or recoverable costs during a DPP regulatory period;
- the treatment of various recoverable costs, in particular those that are subject to approval processes; and
- the application of pass-through costs and recoverable costs under a DPP and a CPP.

Definition of price

J2.2 The mechanism or 'form of control' that is used for capping revenues or prices under price-quality regulation is discussed in Section 8.3 of Chapter 8. This section provides further detail on the definition of 'price' for each service.

J2.3 **EDBs:** Price(s) means individual tariffs, fees or charges or individual components thereof, in nominal terms exclusive of GST in relation to the regulated service. In respect of an electricity distribution service, price may include a Posted Discount.¹³⁶³ For EDBs, the definition of price and the associated units of quantity were consulted on as part of the Reset DPP process and remains appropriate, as it is widely used and understood by them.

J2.4 **GPBs:** Price(s) means individual tariffs, fees or charges or individual components thereof, in nominal terms exclusive of GST in relation to the regulated service. While this has already been consulted on (as part of the consultation on the Draft

¹³⁶³ Posted Discount means a discount to line charges payable for Electricity Line Services where those discounts are offered by way of published tariffs schedules, whose take-up is determined by consumers.

Determinations for GPBs), if any issues are raised about the specification of price during consultation on DPPs it could, if necessary, be amended prior to setting the DPPs for GPBs.

Proportion of costs that can be passed through

J2.5 As noted in section 8.3 of Chapter 8, the Commission has allowed for two categories of costs to be passed through to consumers, namely pass-through costs and recoverable costs. This section responds to submissions on the proportion of costs that may be passed through to consumers under each of these categories.

Pass-through costs

J2.6 All of the costs that are classified as pass-through costs may be passed through, provided that pass-through costs are limited to 100% of those costs associated with the provision of regulated services. To the extent that pass-through costs are associated with both regulated and unregulated services, the pass-through cost amount is limited to the amount of the cost that is allocated to the regulated services by applying the cost allocation IM.

J2.7 EDB submitters supported 100% of pass-through costs being passed through to prices, and did not agree that a lesser percentage was necessary to incentivise cost minimisation.¹³⁶⁴ MEUG suggested that partial pass-through could be used as an intermediate step to removing some costs (e.g. transmission connection charges) from being pass-through costs.¹³⁶⁵ ENA supported the Commission's intention to develop a mechanism that has the potential to provide incentives for EDBs to manage some pass-through costs.¹³⁶⁶ Such an incentive mechanism may be developed in the future as part of the recoverable cost category, which would require an amendment to the IM.

Recoverable costs

J2.8 Unless explicitly stated to the contrary in the IM (as is the case for instantaneous reserves (IR) availability charges, which are a recoverable cost in Transpower's IPP¹³⁶⁷), all of the costs that are categorised as recoverable costs may be passed through, provided the amount has been approved by the Commission for such costs that are subject to an approval process.

J2.9 Vector expressed concerns that the IM gives the Commission a wide degree of discretion as it provides no detail on how or when recoverable costs would be less than 100% passed through, contrary to s 52T(2) of the Act.¹³⁶⁸ ENA suggested that the default should be 100% pass through unless the Commission and the supplier agree to less than that. Unison expressed concern that the approval process may be,

¹³⁶⁴ Orion, *Submission on Input Methodologies: Draft Determination and Reasons Papers for Electricity Distribution Businesses*, 9 August 2010, p. 21, paragraphs 5.23.

¹³⁶⁵ MEUG, *Submission on IM Discussion Paper*, 31 July 2009, p. 4, paragraph 15.

¹³⁶⁶ ENA, *Submission 5 Processes and Rules Input Methodology*, 9 August 2010, p. 11, paragraph 47.

¹³⁶⁷ Commerce Commission, *Input Methodologies (Transpower) Reasons Paper*, 22 December 2010, Section 7.3.

¹³⁶⁸ Vector, *Submission in response to the Commerce Commission's Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, p. 68, paragraph 265.

in effect, a “mini-CPP” subjecting specific costs to detailed process that should be covered within an IM.¹³⁶⁹

- J2.10 As discussed in paragraph 8.3.26 the IM does not provide the Commission with the discretion to simply amend at any time the list of recoverable costs, nor the proportion of those costs that can be passed through. While they do not meet the pass-through cost criteria (usually because the supplier retains at least some control over the costs) they should, at least for the forthcoming regulatory period, be recovered by suppliers in addition to maximum prices and pass-through costs. Over time, if the IM is reviewed in accordance with the provisions of the Act, it could potentially allow for incentive mechanisms to be simply applied to certain elements of recoverable costs, or for partial pass-through of certain costs in appropriate circumstances to incentivise suppliers in how they manage these costs. For example, this may provide an incentive for EDBs to exert pressure on Transpower to reduce costs (especially in the case of NICs) or to seek to manage demand for transmission capacity over time.
- J2.11 In relation to three of the recoverable costs (NIC charges, avoided transmission charges and costs or credits arising from the sale or purchase of balancing gas), it is appropriate for these to be subject to the Commission’s approval. This is because the regulated supplier has a degree of control over the level of these particular costs. As a check on the appropriate level of costs to be passed through to consumers, it is appropriate to assess applications for approval of recoverable costs on a case-by-case basis.
- J2.12 The Commission has decided not to specify a process for approval in the IM. As the specific circumstances facing each individual supplier are likely to be very different, the relevant factors to take into account may also broadly vary. The requirement in s 52T(2)(a) for suppliers to be able to estimate the material effects of the methodology on them does not necessarily dictate what the final numeric proportion of recoverable costs may be passed through - that may depend on future data or circumstances at the time the approval process is applied. The Commission will likely consult on the relevant approval processes as part of its work programme for ensuring consistency between the IMs and the EDBs DPP in 2011, and as part of setting the initial gas DPP, also in 2011.

Adding new pass-through and recoverable costs

- J2.13 Adding new pass-through or recoverable costs during a period is generally undesirable, as regular applications from (potentially multiple) suppliers would increase the costs of regulation and suppliers may be less certain as to which of their costs can be passed through and which they should be required to manage. Nevertheless, some new costs that meet the definition of pass through costs may arise during a regulatory period, and these should be recovered during the period.
- J2.14 The IMs provide for new pass-through costs (in addition to those listed in Chapter 8 (paragraphs 8.3.30 to 8.3.35)) to be allowed where:

¹³⁶⁹ Unison, *Submission on Commerce Commission Draft Input Methodology Determinations: Regulatory Tax, Cost allocation Pricing Methodologies Rules and Processes*, 9 August 2010, pp. 30-31, paragraph 109.

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- the cost is a new levy and has been specified by way of amendment to a DPP determination; or
 - it has been determined as part of a CPP,

and the cost meets the following criteria, namely it must be:

- a. associated with the relevant regulated service;
- b. outside the control of the supplier;
- c. not a recoverable cost;
- d. not already provided for in a DPP or CPP; and
- e. appropriate to be passed through to consumers.

J2.15 Other amendments to the list of pass-through costs will only become effective from the beginning of the next regulatory period (consistent with s 53ZB).

Treatment of various recoverable costs

J2.16 Paragraphs 8.3.34 - 8.3.35 set out the recoverable costs for each service. Some of these are discussed in more detail in other parts of this paper, for example:

- a. costs associated with a CPP application are discussed in Appendix K on CPP Requirements; and
- b. the net incremental carry-forward amounts under the IRIS are discussed in Section 8.5 above.

J2.17 This section provides further detail on the following recoverable costs:

- a. for EDBs:
 - i. transmission charges;
 - ii. system operator charges;
 - iii. NIC charges;
 - iv. avoided transmission charges;
 - v. payments to embedded generators;
 - vi. claw-back applied by the Commission; and
- b. for GTBs, costs or credits arising from the purchase or sale of balancing gas.

Transmission charges

J2.18 PwC submitted that transmission charges should be included as a pass-through cost as they seem to meet the pass-through criteria.¹³⁷⁰ In contrast, MEUG submitted that

¹³⁷⁰ PwC, *Submission to the Commerce Commission Input Methodologies for Electricity Distribution Services Draft Reasons Paper and Associated Draft Determinations (1) Cost Allocation, Regulatory Tax, Pricing Methodologies and Rules and Processes*, 9 August 2010, p. 22, paragraph 71.

transmission charges should not be a recoverable cost and should instead be absorbed within the EDB baselines.¹³⁷¹ In responding to MEUG's submission, Vector submitted that transmission costs are only allocated by Transpower to EDBs as a means of passing the costs onto consumers and there is no principled reason why EDBs should bear these costs.¹³⁷² Powerco submitted that transmission expenditure is a significant proportion of its total electricity revenue and that changing such a large component of Powerco's costs would necessitate a change in the WACC.¹³⁷³

J2.19 The Commission has decided that transmission charges will be allowed to be passed through as a recoverable cost to consumers because:

- a. it is reasonable that suppliers should be able to recover the costs in full, but explicitly providing for the costs in the price-quality path on an *ex ante* basis is, because of the potential variability, likely to result in higher costs to consumers; and
- b. transmission charges are almost entirely outside the control of EDBs due to:
 - i. the aggregate level of transmission charges (excluding charges relating to NICs¹³⁷⁴) being regulated under Part 4 of the Act; and
 - ii. the allocation of Transpower's aggregate transmission revenues to individual suppliers being regulated under the Transmission Pricing Methodology (TPM) in the Electricity Industry Participation Code.

J2.20 Transmission charges have been included as recoverable costs rather than pass-through costs. Transmission costs do not meet the pass-through cost criteria, but they should, at least for the forthcoming regulatory period, be allowed to be fully recovered by suppliers. Incentive mechanisms or partial pass-through of certain costs may be applied in the future. However, this would require the Commission to follow the process for amending the IM set out in s 52V (with the associated merits review provisions that apply). Any such changes would not be able to take effect until the end of the regulatory period (s 53ZB).

System operator charges

J2.21 The majority of system operator charges are included in Electricity Authority levies and are, therefore pass-through costs. However, payments by EDBs for ancillary services are separate from Electricity Authority levies. Rather, they are determined in accordance with Part 8 of the Electricity Industry Participation Code and are largely outside the control of EDBs. The Commission has included such charges as recoverable costs, rather than pass-through costs for the same reasons as for transmission charges, as outlined in paragraph J2.20 above.

¹³⁷¹ MEUG, *Submission on Pan Industry Input Methodologies for cost allocation, treatment of taxation, pricing methodologies, rules and processes and Transpower asset value*, 9 August 2010, appendix p. 3.

¹³⁷² Vector, *Cross Submission on Input Methodologies Draft Reasons Paper*, 3 September 2010, p. 10 paragraph 31.

¹³⁷³ Powerco, *Submission 5 in Response to Draft Input Methodology Decisions and Determinations Cross Submission*, 2 September 2010, p.9, paragraph 29.

¹³⁷⁴ It is proposed that while NICs are a regulated service for Transpower under Part 4 of the Act, revenues related to NICs should be excluded from Transpower's revenue cap.

New investment contract charges

- J2.22 The Commission has included NIC charges as recoverable costs. NIC charges are payable by an EDB under a NIC with Transpower (or an equivalent contract with another transmission provider). The level of the NIC charges is negotiated directly between Transpower and the EDB.
- J2.23 As noted in paragraph J2.10, over time, if the IM is amended in accordance with the provisions of the Act, it could potentially allow for incentive mechanisms to be simply applied to certain elements of recoverable costs, or for partial pass-through of certain costs in appropriate circumstances to incentivise suppliers in how they manage these costs. This may provide an incentive for EDBs to exert pressure on Transpower to reduce costs in the case of NICs.

Avoided transmission charges

- J2.24 With regard to avoided transmission charges, the Commission has included these as a recoverable cost to provide incentives for EDBs to undertake efficient investments that reduce the *total cost* of supplying electricity lines services, where all or part of those services are currently supplied by Transpower. Where such investments reduce the assets employed by Transpower to supply electricity lines services, this will likely translate into lower transmission charges for the EDB that has undertaken the action. If the lower transmission charges were simply passed through to consumers as a recoverable cost there would be little incentive for the EDB to undertake the efficiency-enhancing investment.
- J2.25 Allowing EDBs to recover some or all of the efficiency gain by leaving the recoverable transmission charge amount (for a period) at the same level as they were prior to the efficiency-enhancing investment being made (i.e. an ‘avoided transmission charge’), provides an incentive for EDBs to undertake such investments. If an EDB can own and operate the assets at a lower cost than Transpower, while meeting required quality standards (which may have previously been higher than necessary to meet consumer demands), this investment is likely to be efficient. Avoided transmission charges are restricted to those arising from the purchase of transmission assets from Transpower, so as to avoid incentivising EDBs to invest in assets which cause inefficient bypass of transmission assets.
- J2.26 As with any efficiency gain, this type of saving should be shared with consumers. EDBs should retain the full gain from the efficient investment for a period of five years, following which the gain will accrue in its entirety to consumers. This is similar to the expected five-year carryover of opex efficiency gains under the rolling incentive mechanism discussed in Section 8.5 above and Appendix J3 below.
- J2.27 Submitters sought more information on what happens at the end of the five-year period following the purchase of transmission assets, with Vector submitting an adjustment to a DPP is required so EDBs can recover ongoing opex and capex costs associated with its investment.¹³⁷⁵ No such adjustment is required, as the assets would be added to the RAB from the date of purchase, and the supplier would be

¹³⁷⁵ Vector, *Submission in Response to the Commerce Commission’s Input Methodologies Draft Reasons and Determinations for Electricity Distribution Businesses and Gas Pipeline Businesses Cost Allocation Regulatory Tax Pricing Methodology Rules and Processes*, 9 August 2010, p. 69, paragraph 269.

able to recover the capital and operating costs of such assets from the date of the first reset following purchase.

Claw-back applied by the Commission

J2.28 As set out in section 8.3 (paragraphs 8.3.34 to 8.3.35), the Commission may apply claw-back under:

- a. s 53ZB(3) for EDBs and GPBs under either a DPP and CPP;
- b. s 54K(3) for EDBs under a DPP only; and
- c. s 55F(2) for GPBs under a DPP only.

J2.29 Should claw-back be applied, it is appropriate to give effect to the claw-back as a recoverable cost (either positive or negative), as doing so is likely to make the impact of the claw-back transparent.

Payments to embedded generators

J2.30 Part 6 of the Electricity Industry Participation Code provides a framework to enable connection of distributed generation. Charges for such embedded generation (which may provide a substitute for use of the electricity transmission system) are likely to form part of that framework. Payments of avoided transmission charges to embedded generators have been treated as a distinct recoverable cost category, separate from any avoided transmission charges relating to the purchase of transmission assets. This recognises that those payments are an ongoing obligation, whereas the avoided transmission charges relating to transmission assets need only be treated as a recoverable cost for a finite period to provide appropriate incentives for the acquisition of such assets by EDBs.

Costs or credits arising from the sale or purchase of balancing gas

J2.31 The Associate Minister of Energy and Resources agreed that the GIC should defer making a formal recommendation on balancing and adopt a 'wait and watch' approach.¹³⁷⁶ Balancing arrangements may be reviewed again around February 2012.

J2.32 Submitters considered that costs or credits arising from the GTB's purchase or sale of balancing gas should be treated as pass-through costs.¹³⁷⁷ It is not appropriate for all costs associated with balancing activities to be treated as pass-through costs, as many of these functions can reasonably be expected to be performed by a GTB as part of the regulated service.

J2.33 However, GTBs are not able to influence or control all aspects of their pipeline balancing costs and it may be difficult to allocate all costs associated with balancing to pipeline users. This will only include costs associated with buying and selling balancing gas.

¹³⁷⁶ http://www.gasindustry.co.nz/sites/default/files/u254/Scanned_Letter_16_September_2010.pdf

¹³⁷⁷ Maui Development Ltd., *Submission on GPBs (Input Methodology) Draft Determination and Reasons Paper*, August 2010, p. 4, paragraph 3.4; Vector, *Submission on EDBs and GPBs (Input Methodology) Draft Determination and Reasons Paper, Cost Allocation, Regulatory Tax, Pricing Methodology, Rules and Processes*, 9 August 2010, p. 71, paragraphs 275-276.

- J2.34 For these reasons, costs or credits arising from the GTB's purchase or sale of balancing gas that are not assigned to pipeline users shall be permitted as a recoverable cost. Their quantum will be subject to the Commission's approval.

J3 Incremental Rolling Incentive Scheme under Part 4

- J3.1 This section provides further detail on the mechanics of the IRIS (which was introduced in Section 8.5 above) including:
- a. the carryover period; and
 - b. the application of the IRIS under a CPP.

Carryover period

- J3.2 A mechanism enabling efficiency gains to be retained beyond the end of the regulatory period was generally advocated by regulated suppliers in cross-submissions following the Input Methodologies Conference. However, most did not comment on the length of time that gains should be retained. Submitters on the Draft Reasons Paper proposed that suppliers should retain efficiency gains for longer than five years, with some submitters suggesting a 10 year period.¹³⁷⁸ Following the Input Methodologies Conference, Greymouth Gas submitted that "[t]he Commission needs to be very careful to ensure that the [rolling incentive mechanism] proposed by GPBs (and EDBs) do not inefficiently deter the passing on of gains to consumers".¹³⁷⁹
- J3.3 The AER's Efficiency Benefit Sharing Scheme (EBSS) allows a notional five-year period for the carryover of the benefits of efficiency gains, allowing suppliers to retain the benefit (or loss) between forecast and actual operating expenditure for five years following the year in which it occurred. The Australian mechanism equates to an effective 30:70 sharing ratio between the suppliers and the network users.¹³⁸⁰
- J3.4 To ensure suppliers have equal incentives to seek efficiency gains throughout the regulatory period, the benefits of any efficiency gains under an IRIS should be retained by suppliers for at least the length of the regulatory period. The CPP regulatory period is expected to be five years. However it may be shorter if the Commission considers it would better meet the Part 4 Purpose (s 53W). A five year period is appropriate regardless of whether or not the regulatory period is actually shorter than this. This provides an appropriate balance between promoting efficiency and ensuring that efficiencies are shared with consumers in a reasonable timeframe.

¹³⁷⁸ ENA, *Submission 5 Processes and Rules Input Methodology*, 9 August 2010, pp. 24-26, paragraph 92-101; Powerco, *Submission 1 in Response to Draft Input Methodology and Information Disclosure Determinations*, 9 August 2010, p. 41, paragraphs 161-163; PwC, *Submission to the Commerce Commission Input Methodologies for Electricity Distribution Services Draft Reasons Paper and Associated Draft Determinations (1) Cost Allocation, Regulatory Tax, Pricing Methodologies and Rules and Processes*, 9 August 2010, p. 26, paragraph 88.

¹³⁷⁹ Greymouth Gas New Zealand Ltd, *Post-Workshop Submission - Input Methodologies for Gas Pipeline Businesses*, 15 March 2010, p. 13.

¹³⁸⁰ AER, *Proposed - Electricity transmission network service providers, Efficiency benefit sharing scheme*, April 2008, p. 5.

- J3.5 Unlike the AER's EBSS,¹³⁸¹ where net efficiency losses are allowed to reduce supplier's future opex allowance, the Commission's IRIS is not fully symmetric (as discussed in paragraph 8.5.9 above). This means that suppliers will benefit if they out-perform, but will not suffer commensurate losses if their performance deteriorates. A longer retention period would be associated with greater upside potential for suppliers, but with less downside potential for losses.
- J3.6 A longer retention period might be merited if consumers were likely to benefit from sufficiently low prices in future in return for delays in the time taken for efficiency gains to be shared (consistent with s 52A(1)(c)). No submitter has provided any evidence to suggest that a 10 year retention period would strike a better balance for consumers in this regard. The arguments in favour of a longer retention period would be strengthened, for example, if the IRIS was symmetrical.
- J3.7 The Commission has not created a fully symmetric IRIS as it recognises that this will be the first time such a mechanism may be used by suppliers. If suppliers have made sustained losses over the period it may not be initially appropriate to further affect future opex allowances for revenue determination purposes (i.e. decrease the opex allowance due to incremental losses).

Application under a CPP

- J3.8 As part of default/customised price-quality regulation, the IRIS is intended to improve the incentives that suppliers have to reduce opex that is within their control when they are subject to a CPP.

Determination of the opex allowance subject to the scheme under a CPP

- J3.9 In order to apply the IRIS, suppliers must include in their CPP proposal:
- forecasts of opex for each year of the upcoming customised regulatory period; and
 - a breakdown of which of these costs are to be subject to the scheme – only costs that are within the control of the supplier are eligible for inclusion.
- J3.10 The Commission will undertake an *ex ante* assessment of the forecasts against the evaluation criteria, including assessing the extent to which the proposed opex is controllable and should qualify for the IRIS. The Commission will then determine opex allowances for each year of the regulatory period, and identify which of these costs will be subject to the scheme.

Calculation of incentive-based rewards

- J3.11 The aim of the IRIS is to ensure that suppliers have equal incentives to reduce costs that are within their control year-on-year relative to the allowance for those costs. It is therefore necessary to assess the extent to which suppliers have responded to the scheme in each year and carry forward this information beyond the date at which the CPP comes to an end.

¹³⁸¹ AER, *Final decision - Electricity transmission network service providers, Efficiency benefit sharing scheme*, June 2008.

Figure 9.1 Calculation of Incremental Gains and Losses

Regulatory year	← CPP regulatory period →					← 5-year period following CPP →					
	1	2	3	4	5	6	7	8	9	10	
Opex subject to IRIS											
a	Opex allowance	101	99	99	100	99					
b	Actual opex	99	98	100	102	98					
c	Incremental gain/loss in year	2	-1	-2	-1	3					
Incremental gains/losses carried forward											
d	Year 1	-	2	2	2	2					
e	2		-	-1	-1	-1	-1	-1			
f	3			-	-2	-2	-2	-2	-2		
g	4				-	-1	-1	-1	-1	-1	
h	5					-	3	3	3	3	3
i	Net balance	-	-	-	-	-	1	-1	0	2	3
j	Net balances carried forward (i.e. Recoverable Costs)						1	0	0	2	3

The incremental change is calculated by measuring performance against the allowance in one period relative to performance against the allowance in the previous period. Here the supplier has out-performed in Year 5 by \$1m (\$99m - \$98). This represents an incremental gain of \$3m on the previous year, since the supplier exceeded their allowance by \$2m in Year 4 (\$100m - \$102m).

All values are provided for illustrative purposes only and are expressed in real terms

J3.12 As shown in the illustrative example in Figure 9.1 above, a supplier’s response to the scheme is measured by the amount by which it out- or under-performs its opex allowance in comparison to the previous year. The incremental gain or loss for a year is therefore calculated as the difference between the supplier’s actual and allowed opex for the year less the difference in the previous year. The exception to this is where, at the start of the CPP period, there is no previous year. In these cases, the incremental gain or loss is simply the difference between actual and allowed opex in that year.

J3.13 Each incremental gain or loss is ‘carried forward’ for five years from the date at which it is realised (lines ‘d’ to ‘h’ in Figure 9.2 below). Suppliers automatically retain the benefits of these efficiency gains, or suffer losses, within the CPP regulatory period because prices are not reset¹³⁸² (i.e. between years 1 and 5). There will, however, be a number of incremental gains and losses at the end of the period that suppliers will not yet have been exposed to for a full five year period (these are shown by the amounts appearing in lines ‘d’ to ‘h’ in years 6 to 10).

¹³⁸² These will be inflation adjusted.

Figure 9.2 Incremental Gains and Losses Carried Forward

Regulatory year	← CPP regulatory period →					← 5-year period following CPP →					
	1	2	3	4	5	6	7	8	9	10	
Opex subject to IRIS											
a	Opex allowance	101	99	99	100	99					
b	Actual opex	99	98	100	102	98					
c	Incremental gain/loss in year	2	-1	-2	-1	3					
Incremental gains/losses carried forward											
d	Year 1	-	2	2	2	2					
e	2		-	-1	-1	-1					
f	3			-	-2	-2					
g	4				-	-1					
h	5					-					
i	Net balance	-	-	-	-	-	1	-1	0	2	3
j	Net balances treated as Recoverable Costs						1	0	0	2	3

The green shaded cells represent incremental gains and losses that the supplier is exposed to within the regulatory period.
The cells circled in red represent the incremental gains and losses that the supplier has not yet been exposed to for a full 5 year period.

J3.14 For example, suppliers will only have been exposed to the gain or loss occurring in year 5 for a single year by the time that prices are reset (i.e. in year 5, the year in which the change occurs). This gain/loss must therefore be carried forward for a full five years after the end of the CPP period. In the example above, this is shown by the ‘3s’ that appear in line ‘h’.

J3.15 The net balances in line ‘j’ represent the cumulative amount of incremental over- and under-performance that has occurred in the five years prior to the year in question. As noted above, these net balances are only treated as recoverable costs if they constitute a reward for the supplier. Any negative net balances are therefore set to zero for the purposes of determining recoverable costs (line ‘j’ in Figure 9.3 below). Suppliers are rewarded for any positive net balances carried forward by higher permissible prices in the next regulatory period. The positive net balance is included in the respective compliance formula, as appropriate, in the recoverable cost term (Chapter 8, Section 8.4).

Figure 9.3 Treatment of net balances

Regulatory year	← CPP regulatory period →					← 5-year period following CPP →					
	1	2	3	4	5	6	7	8	9	10	
Opex subject to IRIS											
a	Opex allowance	101	99	99	100	99					
b	Actual opex	99	98	100	102	98					
c	Incremental gain/loss in year	2	-1	-2	-1	3					
Incremental gains/losses carried forward											
d	Year 1	-	2	2	2	2					
e	2		-	-1	-1	-1					
f	3			-	-2	-2					
g	4				-	-1					
h	5					-					
i	Net balance	-	-	-	-	-	1	-1	0	2	3
j	Net balances treated as Recoverable Costs						1	0	0	2	3

Only positive net balances are carried forward.
These are treated as Recoverable Costs, meaning that suppliers will be permitted higher prices to the extent that they have managed to improve their performance year-on-year, but prices will not be reduced.

-
- J3.16 In the event of a catastrophic event that the Commission decides warrants reconsidering the CPP, the net balances carried forward may be adjusted to take into account the effect of the catastrophic event. This ensures that in the case of a catastrophic event, which may result in actual opex being significantly higher than allowable opex, any efficiency gains carried forward are not diminished as a result of the event.
- J3.17 It is expected that the supplier would be required, as part of its annual information disclosure, to include an IRIS reconciliation schedule detailing the following:
- a. the actual opex subject to the scheme that is incurred in the assessment period; and
 - b. where a variance (either positive or negative) from the allowable expenditure has occurred, an explanation of the variance.
- J3.18 An independent third-party audit is expected to be required under information disclosure to verify that any efficiency gains/losses are not as a result of changes in classification of accounting policies and/or capitalisation practices. This is to help ensure that inappropriate categorisation of capex and opex is avoided.
- J3.19 Suppliers will be expected to report any IRIS gains that they have recovered as a recoverable cost as part of their annual compliance statement under either a DPP or a CPP.

Efficiency gains/losses in the final year of the CPP period

- J3.20 When applying the IRIS, an issue arises because a supplier's actual performance for the final year of the regulatory period will not be known at the time the subsequent price-quality path needs to be set. As such, actual opex will be assumed to be equal to allowable opex (i.e. in Figure 9.4 below, the opex is assumed to be \$99m in year 5 when the actual is later found to be \$98m). An adjustment is made in the first year of the next regulatory period.
- J3.21 In the example that follows, this is shown in line 'c'. In year 5, the incremental gain/loss is estimated to be \$0m by assumption (denoted by an asterisk in Figure 9.4). In year 6, this estimate is corrected by \$3m for actual opex in year 5 (note that in the example actual opex in year 5 is \$98m but this is recorded under year 6 as this is the year in which the adjustment is made). This is consistent with the regime adopted by the AER.¹³⁸³

¹³⁸³ AER, *Final decision - Electricity transmission network service providers, Efficiency benefit sharing scheme*, June 2008.

Figure 9.4 Adjustment for final year made at the start of the next regulatory period

Regulatory year	← CPP regulatory period →					← 6-year period following CPP →						
	1	2	3	4	5	6	7	8	9	10	11	
Opex subject to IRIS												
a	Opex allowance	101	99	99	100	99						
b	Actual opex	99	98	100	102	98						
c	Incremental gain/loss in year	2	-1	-2	-1	0*						
Incremental gains/losses carried forward												
d	Year 1	-	2	2	2	2	2					
e	2		-	-1	-1	-1	-1	-1				
f	3			-	-2	-2	-2	-2	-2			
g	4				-	-1	-1	-1	-1	-1		
h	5					-	0	0	0	0	0	
	ADJUSTMENT FOR FINAL YEAR						-3	-3	-3	-3	-3	
i	Net balance	-	-	-	-	-	-2	-1	0	2	3	3
j	Net balances treated as Recoverable Costs						0	0	0	2	3	3

Actual opex is not known at the time that the next price-quality path is to be determined. As shown in the green shaded cells, the incremental change in Year 5 is determined by assuming that the incremental gain is zero (i.e. actual opex equals \$101m).

In Year 6, an adjustment is made to the recoverable costs based on actual opex in Year 5. The adjustment is equal to the difference between actual and assumed opex (i.e. \$101m - \$98m). This adjustment affects recoverable costs from Year 7 onwards.

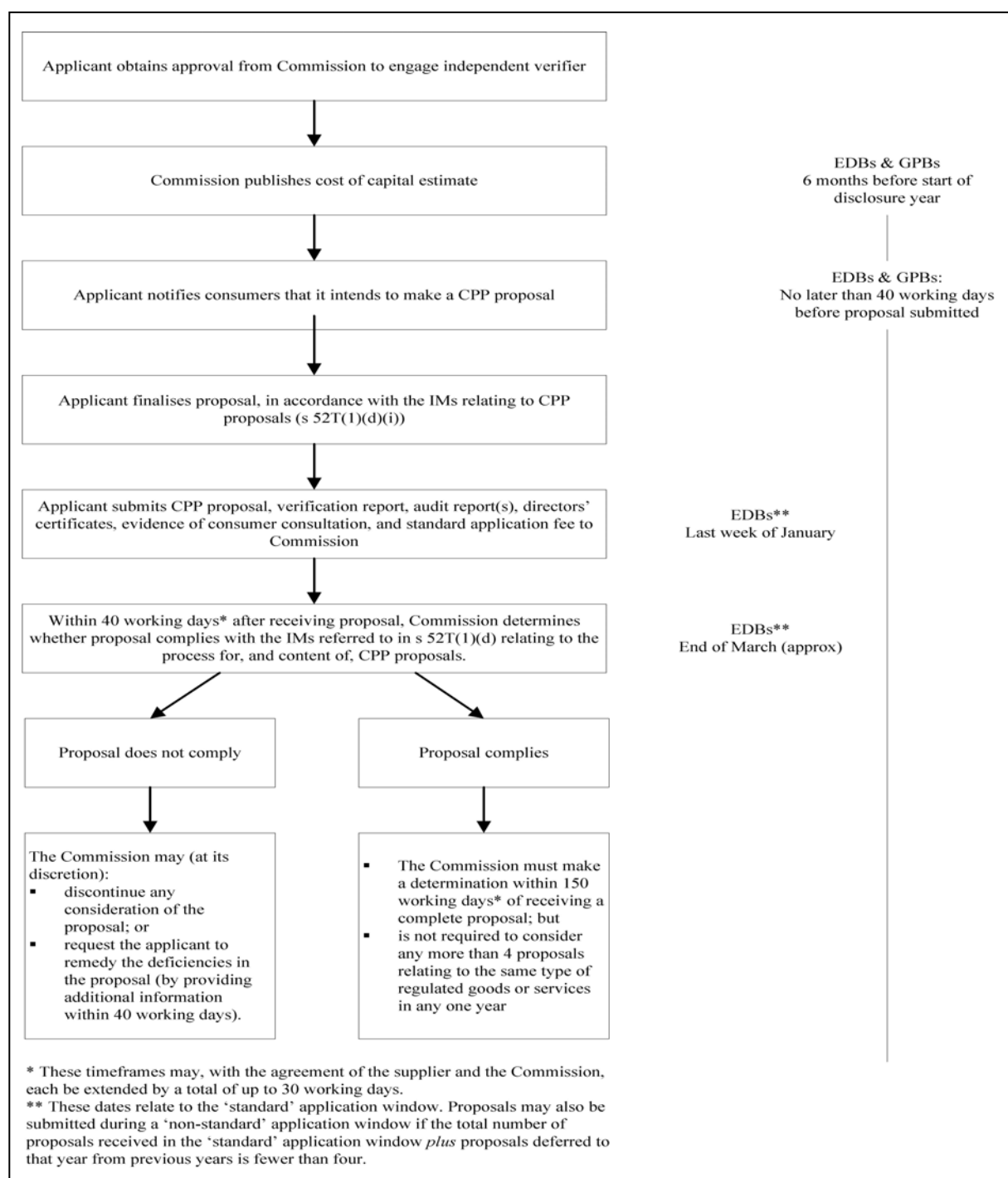
APPENDIX K: CPP REQUIREMENTS

K1 Applying for a CPP

Introduction

K1.1 This section sets out when a CPP proposal may be made and what happens if the proposal is deferred. It also discusses submissions on varying an IM, transitioning from a CPP to a DPP and the recovery of costs of applying for a CPP. Figure K1 provides an overview of the process for submitting a CPP proposal.

Figure K1 Overview of Process for Submitting a CPP Proposal



When a CPP proposal can be made

Overview

- K1.2 Under s 53Q(2)(b) of the Act, every CPP proposal must be made within the period, or by the annual date, specified for the purpose in the s 52P determination. Under s 53O(e), the DPP (which is the relevant s 52P determination) must set out the annual date by which any CPP proposal must be received. These sections are not entirely consistent with each other in that one anticipates a due date for CPP proposals, whereas the other contemplates the possibility of a period within which proposals must be received.
- K1.3 For practical reasons, for EDBs, the Commission intends to set an annual window during which applications must be submitted. As discussed below, this will include a ‘standard’ application window and a ‘non-standard’ application window. The latter will apply in the event that fewer than four proposals (including those proposals deferred from a previous year) are received in the standard application window. For EDBs, the Commission intends to amend the current DPP to include the application windows for CPP proposals as soon as practicable.
- K1.4 The Commission does not intend to set an application window for GPBs. Given the small number of industry participants, it is unlikely that prioritisation of proposals will be required. The Commission intends to specify in the DPP that applies to GPBs (when it is determined) that CPP applications may be received at any time. The Commission’s intended approach is supported by Vector and MDL.¹³⁸⁴
- K1.5 Where a supplier on a DPP experiences a catastrophic event, the Commission intends to accept CPP applications at any time (although the supplier may not make a proposal within 12 months before a DPP is due to be reset (s 53Q(3))).¹³⁸⁵

EDBs only: Application window

- K1.6 The Commission intends to specify the standard application window for CPP proposals for suppliers of electricity distribution services as the final week of January each year.
- K1.7 This window has been selected as it should allow the Commission sufficient time to determine a CPP with a commencement date that aligns with relevant pricing or disclosure years. The Commission has estimated that it requires at least 14 months to determine a CPP (taking into account the statutory timeframes for consideration of a proposal as well as practical considerations such as the timeframes suppliers require in order to notify their customers of any price changes and for these to come into effect).

¹³⁸⁴ Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 24, paragraphs 89-90; Maui Development Limited, *Submission on GPBs Revised Input Methodologies Draft Determination Part 5*, 18 November 2010, p. 4, paragraph 4.2.

¹³⁸⁵ For the avoidance of doubt, the Commission considers that this 12 month exclusion period does not apply in the case of starting price adjustments under the DPP, as that adjustment will not occur at a time that the DPP is ‘due to be reset’. The Commission considers that the DPP is due to be reset at the end of the DPP regulatory period. In other words, suppliers will not be precluded from making a CPP application in the 12 months prior to the date on which starting price adjustments are made.

- K1.8 In addition, the Commission notes that it is necessary for proposals in respect of electricity distribution services to be received each year at approximately the same time, so that the Commission may, if need be, make full use of its prioritisation powers by comparing the various proposals against each other. Where required, those proposals that are considered lower priority (as assessed by reference to the prioritisation criteria in the Act) will be deferred to a subsequent year. In submitting a proposal, an applicant will have the opportunity to explain why it considers that its proposal should be prioritised over others. In doing so, the IMs require a supplier to address the prioritisation criteria specified in s 53Z(3)(b) and (c).
- K1.9 If proposals (other than those that are made in response to catastrophic events) are not submitted within the application window, they will not comply with the requirements and hence the Commission will not be required to consider them. (Under s 53S(2)(a), the Commission may discontinue consideration of a non-compliant proposal). Any consideration of such proposals will be at the Commission's discretion.
- K1.10 The Commission received several submissions suggesting that it should consider assessing CPP proposals received outside of the application window if it received fewer than 4 proposals within the application window. In particular, submitters suggested that it would be reasonable for the Commission to consider proposals received in the period 1 February to 31 March, with the objective of making a CPP determination by 1 December in the same year (that is four months prior to the start of the CPP regulatory period).¹³⁸⁶
- K1.11 The Commission has considered this point and agrees that it is reasonable for the Commission to consider additional proposals if the total number of proposals received in the 'standard' application window plus proposals deferred to that year from previous years is fewer than four. Rather than allowing proposals to be submitted outside of a pre-specified application window, the Commission intends to achieve this by expanding the application window itself. Under s 53Q(2)(b), proposals must be made within the period, or by the annual date, specified for the purpose in the s 52P determination. Section 53O(e) specifies that the relevant s 52P determination is the DPP. In order for proposals made outside of the 'standard' application window to be compliant with s 53Q(2)(b), the Commission intends to specify an additional 'non-standard' application window to apply in the event that the above criteria are satisfied.
- K1.12 The Commission intends to include a shorter additional application window than that proposed in submissions. This is because a shorter window will be required in order for the Commission to be able to prioritise proposals effectively if more than four proposals are received. The additional window is likely to be the first week in March. The Commission notes that it will be required to determine a CPP in respect of prioritised proposals in accordance with the timeframes specified in the Act and is not bound to do so by 1 December in the year that a proposal is received.

¹³⁸⁶ For example: Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 17-18, paragraph 61; Wellington Electricity Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 16, paragraphs 2.3 & 12.2.

Applications due to catastrophic events

K1.13 The Commission will also allow proposals to be submitted at any time following the occurrence of a catastrophic event (although suppliers may not make a proposal within 12 months before a DPP is due to be reset (s 53Q(3))). The approach to defining a catastrophic event for this purpose will be consistent with that which applies in respect of the reconsideration of a CPP (although the materiality threshold that applies to a reconsideration will not apply). In considering whether an event is a catastrophic event, the Commission will take into account whether:

- the event was beyond the reasonable control of a regulated supplier;
- expenditure to rectify the event is not explicitly or implicitly provided for in the DPP;
- the event could not have been reasonably foreseen at the time the DPP was determined; and
- in respect of the event:
 - action required to rectify its adverse consequences cannot be delayed until a future regulatory period without quality standards being breached;
 - remediation requires either or both of capex or opex during the regulatory period; and
 - the full remediation costs are not provided for in the DPP.

K1.14 For EDBs in such circumstances, the Commission would also likely not limit itself to assessing only four applications for a CPP in any one year (as provided for under s 53Z(1)). ENA submitted that it was unclear how the prioritisation criteria would be applied in this circumstance.¹³⁸⁷ The Commission notes that it is unlikely to be able apply the prioritisation criteria in this instance, unless more than four EDBs apply at a similar time for a CPP following one (or more) catastrophic event(s).

K1.15 Applications that are made as a result of a catastrophic event may be eligible for claw-back for the period from the date of the catastrophic event to the CPP taking effect. Claw-back is discussed further below.

When a CPP proposal may be deferred

K1.16 The Act states that only one proposal may be submitted during a regulatory period (s 53Q(3)) and, once it is submitted, it cannot be withdrawn (s 53R(a)). However, it may be desirable for a proposal to be updated in circumstances where consideration of the proposal is deferred by the Commission.

K1.17 A proposal is submitted for a defined period of up to five years, e.g. 2013-2018. If, following the submission of a proposal, the Commission defers consideration of the proposal to a subsequent year in accordance with s 53Z(2)(a) of the Act (in this example the CPP would instead take effect in 2014), the Commission will determine the CPP for the remainder of the proposed period, i.e. it will not consider the end of

¹³⁸⁷ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 70, paragraph 279.

the CPP period to be extended by the length of time the CPP proposal is deferred. This means that it will not require information to be submitted to cover any additional years (in this example for 2019).

- K1.18 Some submitters disagreed that the CPP should be determined for the remainder of the proposed period, rather than additional information being provided for the period of time the CPP proposal is deferred. They considered that this would effectively mean that they were unable to earn the revenue that they had proposed in their CPP proposal.¹³⁸⁸ Submitters wanted the opportunity to provide updated information so that the CPP period is extended. Having considered this issue, the Commission is of the view that it will be more appropriate for claw-back to be used to compensate for the deferral, rather than extending the required forecast information. This is because, in providing extended forecast information, CPP applicants would not be able to make a simple amendment to their initial proposal. Instead, additional changes would be required to all of the related underlying assumptions contained in the proposal. In other words, the applicant would essentially be making a new proposal, contrary to the provisions of the Act (s 53Q(3)).
- K1.19 While the Commission's expectation is that the same forecast information would be used to determine the CPP that has been deferred, there may be instances where other information in the CPP should be updated. The Commission intends to notify the applicant of the date by which the Commission is likely to commence its consideration of the proposal. Immediately prior to that date, the Commission may, under s 53ZD, require the applicant to provide it with further information regarding any material changes that may need to be made to the proposal, including supplementary comment on those changes from an independent verifier. The Commission considers that it is reasonable for it to view any update to a deferred proposal as an amendment to the original proposal (i.e. as part of the same proposal), rather than as a new proposal and hence as something that is permitted under the Act.

Application of claw-back

- K1.20 Under s 53V of the Act, the Commission may apply claw-back in determining a CPP, if it sets a lower or a higher price than applied under the DPP. The term 'claw-back' is defined in s 52D. The Commission considers that there is some ambiguity as to what it means to apply claw-back under s 53V, given that relevant timeframes are not specified. The section may be read as enabling the Commission to apply claw-back in respect of prices charged by the supplier from the beginning of the current DPP regulatory period.¹³⁸⁹

¹³⁸⁸ For example, Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 8, paragraph 20; Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, pp. 25-26, paragraphs 96-97; Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 19, paragraphs 71-72.

¹³⁸⁹ Some submitters considered that claw-back should be applied to the date of a DPP reset if a proposal is made in the year following its implementation. See Unison Networks Ltd, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 3, paragraph 11; and Vector Limited, *Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, 3 September 2010, p. 16, paragraph 52.

- K1.21 However, this would appear to be unduly retrospective, and the information needed to undertake this assessment would unlikely be available given the Commission has not determined a CPP for the years of the DPP period prior to the CPP being sought. Hence, the Commission considers that it is more appropriate for the Commission to use this power where a proposal has been deferred, or where a CPP is made in response to a catastrophic event, in order to reimburse the applicant, or compensate consumers, for the delay in setting the CPP.¹³⁹⁰
- K1.22 In the case of deferral, any claw-back would only relate to the time period of deferral, and not to the time since the beginning of the current DPP regulatory period. If claw-back was applied for a deferred CPP, this would be done through an adjustment, by the Commission, to the calculation of MAR from BBAR.

Varying an IM

- K1.23 Under s 53V(2)(c) of the Act, in determining a CPP, the Commission may, with the agreement of the supplier, vary an IM that would otherwise apply to the supplier. Vector submitted that the Commission should clearly set out in the evaluation criteria that a supplier may propose an alternative IM and that this will be considered as part of the proposal.¹³⁹¹ Applications to vary an IM that would otherwise apply to the CPP proposal may be submitted alongside the proposal. This cannot, technically, be part of the CPP proposal as, under s 53Q(2)(d) of the Act, proposals must apply or adopt all relevant IMs. This suggests that suppliers who want to propose an amendment to an applicable IM must submit not only an IM-compliant proposal, but also a version of the proposal as it would appear if an amended IM applied to it. This will allow the Commission to assess the effect of the proposed variation to the IM before agreeing to any amendment in accordance with s 53V(2)(c).

Expiry of a CPP

- K1.24 Under s 53X of the Act, when a CPP ends, a supplier becomes subject to a DPP (unless it has been granted a new CPP). The starting prices that apply at the beginning of the next DPP are those that applied at the end of the CPP unless, at least four months before the end of the CPP, the Commission advises the supplier that different starting prices must apply. Submitters have requested guidance from the Commission on the likely exercise of the Commission's discretion under this provision. Specifically, submitters consider that the Commission should note in an IM its process for a supplier when transitioning from a CPP to a DPP and allow suppliers to address this process as part of a CPP proposal. Submitters proposed that any starting price adjustments be made only following consultation.¹³⁹²

¹³⁹⁰ Claw-back may also be applied where a CPP is made in response to a catastrophic event (see Chapter 8).

¹³⁹¹ Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 19, paragraph 63.

¹³⁹² Orion New Zealand Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 3, paragraphs 8.6-8.7; Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 35, paragraph 136; Electricity Networks Association, *Submission on EDBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, p. 4, paragraphs 17-18; Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 29, paragraph 113; Wellington Electricity Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path*

K1.25 The Commission does not consider it appropriate to detail in an IM the likely exercise of its discretion under s 53X, given that a process for resetting starting prices is set out in the Act, including the requirement to consult.

Recovery of costs of applying for a CPP

K1.26 There are three categories of costs associated with making a CPP proposal:

- the CPP application fee (payable by the applicant under s 53Q(2)(c));
- the Commission's assessment costs (recoverable from the applicant under s 53Y); and
- the supplier's own costs of making a CPP proposal.

K1.27 As any CPP should ultimately be to the long-term benefit of consumers, at least some of the costs associated with making a proposal should be recoverable by suppliers from consumers. Where costs are within the control of the supplier, it should have incentives to minimise the costs and also to ensure that the proposal is of sufficient quality for the Commission's assessment.

K1.28 The IM is that, provided the proposal is not discontinued, the supplier may recover:

- the CPP application fee;
- the fee payable to the Commission for the purpose of covering the Commission's assessment costs; and
- all of the external costs associated with audit and verification requirements that are included in the IMs for CPP requirements, including those associated with reports from an independent engineer.

K1.29 Linking the cost recovery to the proposal not being discontinued is important to provide incentives for an applicant to submit a good quality proposal. This approach to costs that can be recovered recognises that, for a well-governed and managed business, the main *incremental* costs (compared to business-as-usual costs) associated with making a proposal are likely to be the costs associated with auditing and verifying the proposal, in particular the requirement to provide an independent verification report completed and included alongside the proposal.¹³⁹³ This is because, other than the audit and verification information specifically relating to the submission of a CPP proposal, a well-governed and managed business would be expected to already have prepared for its Board most, if not all, of the information necessary to prepare a CPP proposal.

Requirements, 23 August 2010, p. 19, paragraphs 2.3 and 14.2; Wellington Electricity Lines Limited, *Submission on EDBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, p. 4.

¹³⁹³ This view was supported by Powerco's submission that "the costs of audits and the independent assessment are likely to be a significant part of the total cost of a CPP application". Powerco Limited, *Post-Workshop Submission Customised Price-Quality Path*, 19 April 2010, paragraph 25.

- K1.30 Submitters considered that the additional costs associated with strengthening institutional processes and preparing a CPP proposal should be fully recoverable, including the costs associated with:
- making institutional changes linked to the higher level of discipline required of a CPP (relative to a DPP);¹³⁹⁴ and
 - meeting consumer consultation requirements because suppliers do not routinely consult with their consumers in the manner required in the IM.¹³⁹⁵
- K1.31 Determining the incremental costs associated with strengthening institutional processes and preparing a proposal above the ongoing or ‘business-as-usual’ costs of supplying the regulated services would be highly subjective and difficult to verify. Furthermore, an allowance for operating costs (including the costs of regulatory compliance) will already be included in the operating cost baseline that is (implicitly or explicitly depending on the instrument) reflected in the price path.
- K1.32 MEUG submitted that only 50% of the costs of making a CPP should be recoverable, as it considered that this is more consistent with sharing efficiency gains with consumers, as provided for in the Part 4 Purpose.¹³⁹⁶ Vector disagreed with that proposal in its cross-submission.¹³⁹⁷
- K1.33 Audit and verification costs of a CPP application will not be entirely outside the applicant’s control, therefore allowing full recovery of these costs may dampen the incentives to minimise them. On balance, however, as these costs are directly linked to making a CPP proposal and can be objectively measured, it is considered preferable to allow their full recovery instead of allowing only a portion (e.g. 70%) of the total incremental preparatory costs of making a proposal.
- K1.34 For the avoidance of doubt, for the reasons outlined above, costs associated with external consultants’ reports obtained whilst preparing the proposal are not included as recoverable costs. Several submitters argued that such costs should be recoverable.¹³⁹⁸ However, the Commission expects that a supplier would require the same level of advice in preparing investment and expenditure plans for Board approval, whether or not it is applying for a CPP.

¹³⁹⁴ Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 12.

¹³⁹⁵ Unison Networks Ltd, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 4, paragraph 17; and Vector Limited, *Cross Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper*, 3 September 2010, p. 15, paragraph 49.

¹³⁹⁶ Major Electricity Users’ Group, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 16 August 2010, p. 2.

¹³⁹⁷ Vector, *Cross Submission on Input Methodologies Draft Reasons Paper*, 3 September, p. 15, paragraph 50.

¹³⁹⁸ For example, Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 8-12, paragraph 21; Nelson Electricity Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 4, paragraph 15; Unison Networks Ltd, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp.2-3, paragraph 8; Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 24, paragraph 87; Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 21, paragraph 80.

K2 Determining a CPP

Price Path

K2.1 This section discusses the calculation of the price path (i.e. maximum allowable revenue) in more detail.

Role of Demand Forecasts

K2.2 Demand forecasts are a key input to:

- determining expenditure requirements - demand forecasts are required because demand is a key driver of capex and opex (in particular, system growth and connection capex); and
- calculating the price/revenue path - under a weighted average price cap (or revenue cap) form of control, demand forecasts are required to determine the price/revenue path so that maximum allowable revenue is recovered on an *ex ante* basis.

K2.3 All else being equal, higher forecast demand is likely to lead to higher expenditure requirements. While the higher expenditure might justify a higher price path, an increase in demand (in the absence of expenditure) would be consistent with a lower price path (and vice versa).¹³⁹⁹ This may result in a healthy tension between the incentive for suppliers to forecast high demand to justify increased expenditure and the incentive to forecast low demand in order to secure a higher price path. For a revenue path, increased demand *per se* does not affect the revenue path (although it does affect the transformation of MAR from BBAR), but it does affect the prices customers will pay. However, increased demand that results in greater expenditure would justify a higher revenue path. This may provide an incentive for suppliers to forecast high demand.

K2.4 Different types of demand information is sought for the purpose of determining the expenditure requirements as opposed to the price/revenue path. For the purpose of determining the expenditure requirements, information on consumer numbers, volumes and average usage is sought by applicant-defined consumer categories.¹⁴⁰⁰ For the purpose of determining the price/revenue path, information is sought by demand group. While the form of the forecast may be different for each purpose, the supplier must demonstrate that the two forecasts are consistent with each other.

K2.5 Given the importance of the demand forecast for setting revenues, the reasonableness of the demand forecast, and consistency of demand forecasts throughout the proposal will be assessed by the independent verifier.

¹³⁹⁹ That is, if a set amount of expenditure is to be recovered and forecast demand is relatively high, this will result in a relatively low price path and vice versa. For example, if expenditure is \$2000 and demand is forecast to be 200 units, the price will be \$10 per unit (i.e. \$2000/200). If demand is instead forecast to be 100 units, the price will be \$20 per unit (i.e. \$2000/100).

¹⁴⁰⁰ However, for GTBs, information is not required on consumer numbers and average usage and does not need to be presented by consumer category.

Setting BBAR

- K2.6 The BBAR formula is set out in Section 9.3 of Chapter 9. That formula is presented differently in the IM Determinations, because the BBAR value cannot be determined directly from it. The ‘forecast regulatory tax allowance’ term in the formula is itself dependent on the BBAR value, creating a circularity. The formulae in the Determinations avoid this circularity by making BBAR the subject of the formula. The formulae in the Determinations also reflect the particular tax approach applicable, which depends on the type of regulated service.
- K2.7 In the IM Determination for gas transmission services, the formula is presented in two forms because a tax payable approach applies. Under a tax payable approach, the second formula applies in the situation where tax losses arise. In the IM Determinations for electricity distribution services and gas distribution services, the formula is presented in one form because, under a deferred tax approach, tax losses are unlikely to be forecasted.
- K2.8 As discussed in Section 9.3 of Chapter 9, a supplier must present its calculation of BBAR and forecast RAB in spreadsheet format with sufficient functionality for the Commission to check the calculations and formulae. The Commission intends to develop a revenue model template that is consistent with the IMs, which a supplier may use in preparing its proposal. This will be released as soon as practicable. The spreadsheet model will not be part of the IM and will be provided as guidance on the level of detail and functionality expected in a supplier’s proposal, rather than being a mandatory requirement. Given the importance of an accurate revenue calculation, the IM requires that the supplier’s spreadsheet be audited in respect of whether the information is accurately presented.

Setting MAR

- K2.9 As discussed in Section 9.3 of Chapter 9, once the BBAR has been derived, the next step is to determine the MAR after tax, which is NPV-equivalent to the BBAR after tax over the regulatory period. In order to calculate MAR for each year of the regulatory period (except the first) an inflation rate (based on changes in the CPI)¹⁴⁰¹ must be applied to MAR in the previous year.¹⁴⁰²
- K2.10 A spreadsheet must be provided in a CPP proposal that clearly demonstrates how MAR before tax and MAR after tax for each year of the CPP regulatory period have been derived from BBAR. A supplier must also include information on the inputs to the calculations, including the X factor¹⁴⁰³ and forecast demand.
- K2.11 One of the reasons the Commission may determine an alternative MAR to that proposed by the supplier is to take account of claw-back. As discussed in Section K1 of this appendix, claw-back may be applied as a result of a proposal being deferred or a proposal being submitted as a result of a catastrophic event. Where

¹⁴⁰¹ See Section E12 for further discussion on the source of the CPI.

¹⁴⁰² In the first year, MAR is calculated such that the present value of the series of MAR equals the present value of the series of BBAR (less any value of claw-back).

¹⁴⁰³ If a different X factor is proposed to that set out in the supplier’s DPP, supporting evidence must be provided as to why it would better meet the Part 4 Purpose.

claw-back is applied, the Commission will add or subtract the relevant amount of claw-back from BBAR after tax before transforming BBAR into MAR.

EDBs only: Quality – information requirements for quality standard variation

K2.12 As discussed in Chapter 9, an EDB may submit a proposal that includes a variation to the quality standards under a DPP (‘quality standard variation’). This might be as a standalone CPP proposal for a quality standard variation only (a ‘quality-only proposal’) or as part of any CPP proposal that seeks a change to price as well.

K2.13 This section describes the information required to be included in a CPP proposal where:

- a quality standard variation is sought; and
- the proposal is a quality-only proposal.

K2.14 The information that is required in respect of a quality standard variation is based on the methodology used to determine the quality standards. This section therefore first sets out why the Commission considers that the methodology for calculating reliability limits under DPPs is appropriate to apply to CPPs too.

Methodology for calculating reliability limits under a DPP and CPP

K2.15 The Commission notes that although EDBs have generally agreed with the use of reliability metrics under DPPs, the approach used in the DPP initial reset determination to calculate reliability limits has been considered inappropriate by some EDBs. EDBs that sought the use of different quality standards in the IM Determination did not seek alternative metrics to SAIDI and SAIFI but rather sought variations to the SAIDI and SAIFI methodology by which compliance is determined. EDBs sought a number of changes, including to:

- the historic period from which the starting dataset is collected;
- the method used to normalise the datasets;
- the calculation of the historic average from normalised data; and
- the calculation of the ‘dead band’ used to determine the reliability limit.

K2.16 The Commission considers the methodology set out in the DPP initial reset determination for calculating reliability limits¹⁴⁰⁴ to be appropriate for a DPP. The reliability limits methodology defined in the DPP initial reset determination has been set in a manner that seeks to mitigate the incidence of breaches caused by circumstances that are reasonably beyond the direct control of a non-exempt EDB (through use of a ‘dead band’ and a three year assessment period to determine whether a breach has occurred), thus providing greater certainty to regulated

¹⁴⁰⁴ Commerce Commission, *Electricity distribution default price-quality path determination pursuant to Part 4 of the Commerce Act 1986, Decision No. 685*, 30 November 2009, clause 9.

suppliers.¹⁴⁰⁵ Were, in the future, the Commission to consider the methodology no longer appropriate, then it should be reconsidered as part of the DPP for all affected suppliers rather than as part of individual CPP applications. The methodology for calculating reliability limits under a DPP will therefore be used to calculate reliability limits under a CPP.

Requirements to be met by the supplier - proposed quality standard variation

K2.17 The methodology for calculating reliability limits prescribed in a DPP determination stipulates the use of a historic time series of service quality data, where the data represents underlying quality. The scope of a proposal for a quality standard variation recognises that there may be circumstances in which the supplier considers that the historic time series of service quality data prescribed in a DPP determination substantially overstates the realistically achievable performance over the future regulatory period. The information requirements are therefore based upon changes to the data used in the calculation of reliability limits.

K2.18 Where a quality standard variation is sought, the supplier must:

- provide justification for the change, including expert evidence from an engineer as to the extent to which the quality standard variation better reflects the realistically achievable performance of the EDB over the CPP regulatory period based on either or both of:
 - i. statistical analysis of past SAIDI and SAIFI performance; and
 - ii. the level of investment provided for in proposed maximum allowable revenue before tax.

The scope of the engineer's report will depend on the reason why the historic data is considered to be unrepresentative of realistically achievable performance over the CPP period;

- provide an estimation and evaluation of the effect of the proposed quality standard variation, had it applied in an earlier period of 5 years by use of historic data, by contrast with the quality standards specified in the DPP determination; and
- provide evidence of the consumer consultation it has undertaken in respect of the proposed standards and the results of that consultation.

Additional requirements to be met by the supplier - quality-only proposal

K2.19 If the quality standard variation is part of a quality-only proposal, in addition to the information on the proposed quality standard variation, a supplier only needs to provide the following information in its proposal:

- the reasons for the proposal;
- information regarding priority of the proposal (unless the proposal relates to a catastrophic event); and

¹⁴⁰⁵ Commerce Commission, *Initial Reset of the Default Price-Quality Path for Electricity Distribution Businesses*, Decisions Paper, 30 November 2009, pp. 9-10, paragraph 2.22.

- the length of the regulatory period (if it is seeking a regulatory period of less than five years).

K2.20 A quality only proposal need not be accompanied by a verification report.

K3 Forecast Expenditure - Requirements on a Supplier

K3.1 This section provides further detail on the Commission's top-down service-based approach to assessing expenditure and the information requirements necessary to support that assessment.

Expert advice on opex/capex information requirements and consultation process

K3.2 As discussed in Section 9.5 of Chapter 9, the Commission engaged Strata to assist it in developing the CPP opex, capex and demand information requirements, with separate requirements for EDBs, GDBs and GTBs. The following table summarises the consultation process and Strata's input throughout the process.

Table K1 Summary of Consultation Specifically on Opex/Capex/Demand Information Requirements

Date	Step
11 February 2010	<p>CPP Workshop (March 2010) Notification and consultation materials, including:</p> <ul style="list-style-type: none"> • CPP - Independent Verifier Framework and Terms of Reference, February 2010; • Strata Energy Consulting, CPP Information Requirements Draft Overview Paper, February 2010; • Strata Energy Consulting, Qualitative Draft Electricity Distribution CPP Information Requirements, February 2010; and • Strata Energy Consulting, Quantitative Draft Electricity Distribution CPP Information Requirements, February 2010.
30/31 March 2010	<p>CPP workshop (attended by Strata), with transcripts released on 6 April 2010:</p> <ul style="list-style-type: none"> • Transcript - CPP Workshop Day 1, 30 March 2010; and • Transcript - CPP Workshop Day 2, 31 March 2010.

Date	Step
7 April 2010	Invitation for CPP post-workshop submissions and further consultation materials: <ul style="list-style-type: none"> • Strata Energy Consulting, Qualitative Gas Transmission CPP Information Requirements for consultation, April 2010; • Strata Energy Consulting, Quantitative gas transmission capex_opex info reqmts overview for consultation, April 2010; • Strata Energy Consulting, Quantitative gas distribution capex_opex info reqmts overview for consultation, April 2010; and • Strata Energy Consulting, Qualitative Gas Distribution CPP Information Requirements, April 2010.
20 May 2010	Workshop on gas opex/capex/demand terminology (attended by Strata).
2 July 2010	Release of Draft Commerce Act (Input Methodologies) Determinations: one each for EDBs / GDBs / GTBs Draft Determinations accompanied by: <ul style="list-style-type: none"> • Input Methodologies for Electricity Distribution Businesses and Gas Pipeline Businesses, Companion Paper (Draft Determinations and Customised Price Quality Path Requirements); and • Strata Energy Consulting, Specifying the CPP information requirements relating to capital expenditure, operating and maintenance expenditure, and demand, For the Commerce Commission, June 2010 (6 reports)

Overall approach: top-down service-based assessment

K3.3 At the core of the service-based approach is the concept that network expenditure is driven by the need to deliver regulated services. A service-based approach is complementary to the top-down approach as it enables assessment of the proposal to primarily target business outputs and business systems, which is where the focus of the supplier’s senior management and Board typically rests.

K3.4 In contrast to a service-based approach, an asset based approach does not provide a direct link between the supplier’s expenditure and the services delivered. Instead, the justification for expenditure is likely to be made from a technical perspective, requiring larger quantities of information at a more detailed level, as well as technical expertise. Adopting a service-based approach has eliminated the need for a number of very detailed information requirements, such as individual asset condition and age profiles and a breakdown of assets by geographic location. It also means the information requirements could be developed to provide flexibility for suppliers to provide information on any new services developed to respond to changing consumer needs.

Development of information requirements to support service-based approach

K3.5 The information requirements were developed to enable to the Commission to assess:

- first, whether a regulated supplier’s policies, strategies and procedures are appropriate, such that services will be provided efficiently and align with consumer demands; and

- second, whether those policies, strategies and procedures are applied in practice, such that proposed expenditure levels are consistent with those policies, strategies and procedures.

K3.6 In order for the Commission to undertake the second part of the assessment, more detailed information is required for a subset of projects or programmes. The Commission has adopted a materiality approach for sampling projects (see below). This assessment should provide the Commission with confidence (or not) about the governance processes and management practices adopted in the business, and therefore inform the Commission's assessment of whether the total proposed expenditure meets the expenditure objective.

Categorising information requirements into qualitative and quantitative components

K3.7 Information can be viewed as both qualitative and quantitative in nature, in the sense that some information is descriptive, whilst other information is based on numerical data. Separating information requirements into qualitative and quantitative components will enable the supplier to provide context and reasoning for the forecast expenditure contained in the quantitative data. More detail on the information requirements is provided below.

Consistent set of information requirements across sectors

K3.8 There are a number of similar elements to the services delivered by electricity and gas suppliers. However, there are also some elements which differ due to the physical characteristics of each energy type (e.g. gas can be stored in the network for a material length of time whereas electricity cannot). The information requirements have been developed so that they are common between the sectors where possible. Differences between the requirements have been limited to instances where the unique sectoral characteristics require it.

Materiality approach for sampling projects

K3.9 As discussed in Section 9.5 of Chapter 9, the concept of materiality is important to the information requirements to promote a cost-effective approach. The requirements place a greater emphasis, and require more detailed supporting information, on material aspects of the proposal.

K3.10 PwC and Nelson Electricity suggested alternative approaches to materiality for smaller businesses where their proposed expenditure was less than an absolute threshold.¹⁴⁰⁶ The Commission has not adopted these suggestions as the size of the expenditure programme for smaller EDBs is likely to have a proportionately similar effect in terms of prices as a large expenditure programme for a large EDB. The Commission considers relative, not absolute, thresholds should be used.

¹⁴⁰⁶ PricewaterhouseCoopers on behalf of 20 EDBs, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, pp. 11-13, paragraphs 25-29; Nelson Electricity Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 3, paragraph 13.

K3.11 Nelson Electricity also submitted that the requirements for identified programmes were unduly excessive and not reflective of the capex and opex budgets of small networks.¹⁴⁰⁷ The Commission considers that a balance needs to be struck between:

- exposing the more material and/or important expenditures within a forecast to a greater level of scrutiny; and
- keeping the preparation effort to a reasonable level.

K3.12 To the extent that forecast expenditure by project or programme for smaller suppliers is lower than for larger suppliers, the Commission expects that the approach will be reasonably scalable in terms of the effort required to prepare information. Smaller projects are likely to be less complex in general, requiring less effort in planning and forecasting.

K3.13 Suppliers will be required to provide more detailed information on:

- the five largest capex projects or programmes by total expenditure;
- the five largest opex projects or programmes by total expenditure;
- the two largest categories of non-system fixed asset capex by total expenditure; and
- ten capex/opex projects/programmes that relate to the business-specific key drivers of the CPP application, selected by the independent verifier based on 'specified' or 'pre-set' selection criteria.¹⁴⁰⁸

K3.14 The criteria to be used by the verifier in selecting the projects or programmes are:

- that while not of a significant size as measured by total forecast expenditure, a programme could be material based on a significant business risk that it addresses;
- that a new service category is being proposed;
- that the circumstances relating to a service category, service level or programme might require a significant step change in expenditure; and
- that a significant change in asset management strategy may result in a rebalancing of expenditures across expenditure categories or a significant investment in strategic business support systems (such as IT systems).

¹⁴⁰⁷ Nelson Electricity Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 3, paragraph 11.

¹⁴⁰⁸ Wellington Electricity submitted that the verifier should only select five additional programmes for detailed assessment (rather than ten) in order to prevent obligations on suppliers from being overly onerous. (See: Wellington Electricity Lines Limited, *Submission on EDBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, p. 6, paragraph 3.2.) However, the Commission considers that ten additional projects or programmes will provide a reasonable sample for the verifier and Commission to undertake a detailed assessment of projects that relate to the business-specific key drivers a proposal and that this will be an important area of assessment. It does not consider that this requirement is unduly onerous.

K3.15 The extent of information required in a CPP proposal for the projects or programmes referred to in paragraph K3.13 will be greater than for other projects or programmes, in particular with respect to the amount of qualitative information to be provided.¹⁴⁰⁹ In accordance with its terms of reference, the verifier is required to undertake a more detailed assessment of these projects or programmes than other projects or programmes.

Overview of information requirements

- K3.16 As noted, information requirements are split into qualitative and quantitative requirements. The qualitative requirements relate to the descriptive information required in a proposal (as set out in Schedule D of the IM Determinations). The requirements are structured in order to provide a descriptive pathway through the regulated supplier's services, its asset base, consumer demands and its governance and management practices (including their application in developing expenditure forecasts).
- K3.17 Basic quantitative information is required for all projects and programmes. The requirements were designed to enable the Commission and the verifier to use tools such as trend analysis and internal benchmarking to identify any areas of potential concern with regard to prudence and efficiency of expenditure plans. The Commission could then follow up on any such concerns by seeking more detailed information.
- K3.18 Quantitative information must be provided in spreadsheet format and contain the information specified in the regulatory templates (see Schedule E of the IM Determinations).¹⁴¹⁰ The Commission will release active spreadsheets to demonstrate the level of detail and functionality expected and suppliers may choose to use them in making their proposals. The information specified in the spreadsheets (i.e. the tables in Schedule E of the IM Determinations) is required to be provided. However, as with the revenue model (discussed in paragraph K2.8) the use of the Commission's spreadsheet is not a mandatory requirement as it is not part of the IM.
- K3.19 All expenditure on assets must be assigned to a project or a programme. MDL considers that the requirement to assign expenditure to a multitude of projects and programmes will be costly and burdensome and questions the value of applying arbitrary rules to do so.¹⁴¹¹ Providing expenditure information at the project/programme level is necessary to enable the Commission to assess linkages between expenditure and services or outputs over time. The definition of project and programme is intentionally broad and the Commission considers that this gives

¹⁴⁰⁹ Information on the additional 10 projects or programmes will only be provided to the verifier after the verifier has notified the supplier of its selection.

¹⁴¹⁰ Instructions on completing the regulatory templates are provided in the determinations.

¹⁴¹¹ Maui Development Limited, *Submission on the Draft Input Methodologies (Gas Pipeline Businesses) Determinations and Draft Reasons Papers*, 9 August 2010, p. 9, paragraph 7.2. Wellington Electricity also considered that opex information should be provided at the opex category level, rather than the programme level. See: Wellington Electricity Lines Limited, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 12; and Wellington Electricity Lines Limited, *Submission on EDBs Revised Input Methodologies Draft Determination Part 5*, 19 November 2010, p. 6.

suppliers significant flexibility as to how they define their projects and programmes and aggregate their information.

K3.20 All projects or programmes must be assigned to:

- one opex/capex category. These are defined categories, which must be used by all suppliers and are based on equivalent definitions drawn from the electricity information disclosure requirements (and which are considered to be appropriate for gas businesses);
- one service category. Although guidance is provided on the expected service categories based on the characteristics of each regulated service, the appropriate service categories, service measures¹⁴¹² and service levels¹⁴¹³ are left to the supplier's discretion; and
- the relevant asset categories. These are again defined categories, which must be used by all suppliers and are based on equivalent definitions drawn from the current electricity information disclosure requirements, with appropriate adaptation for gas assets.

K3.21 A separate opex category is used to capture all indirect expenditures as these are not directly relevant to expenditure on assets.

K3.22 The supplier must also (among other things):

- make transparent the extent to which services in respect of projects or programmes are undertaken by related parties;
- justify its forecast of controllable opex as the IRIS will apply to controllable opex only (see Appendix J3);
- provide assumptions regarding indexation (see discussion below);
- provide details of any contingency amounts included in the expenditure forecasts; and
- justify any proposed self-insurance allowance (see discussion below).

Indexation

K3.23 Information in relation to the indices or escalators that an applicant has applied in the calculation of its opex and capex forecasts is necessary for assessment of the proposed expenditure against the opex/capex evaluation criterion (i.e. the expenditure objective).

¹⁴¹² Each service category should include one or more service measures that reflect relevant, quantifiable, objective metrics by which the delivery of each service may be measured. Service measures will in general be relevant to the needs and interests of the consumers of the specific service.

¹⁴¹³ Service levels apply to each service measure to reflect consumer demands for each service and should drive expenditure and thereby act as benchmarks against which performance in the future may be assessed.

K3.24 The Commission will allow a supplier to propose escalators in its proposal (rather than mandating any). This flexibility enables a supplier to propose escalators that are tailored to the relevant underlying costs and the supplier's particular circumstances. Suppliers must submit a completed regulatory template (Table 7 in Schedule E of the IM Determinations) for each escalator proposed, along with supporting information (including an explanation of the methodology underlying the calculation of each escalator).

Self-insurance

K3.25 Appendix H discusses compensation for Type I asymmetric risk¹⁴¹⁴ in the context of the cost of capital. The Commission has not adjusted the cost of capital to allow for Type I risk.

K3.26 For the purpose of a CPP, the Commission will allow a supplier to recover an allowance for self-insurance as long as it is clear: what risks are being insured; that these risks are credibly self-insured (as opposed to being recoverable *ex post* through reconsideration of the price-quality path); and the self-insurance premium has been independently verified as appropriate by an actuary with the necessary expertise. A supplier must provide the information specified in clause D15 of the IM Determinations. Should a self-insured risk eventuate during the CPP period, then the supplier will not receive *ex post* compensation for that event via a reconsideration of the price-quality path.

Transitional arrangements for historic information

K3.27 The Commission recognises that, initially at least, there will be difficulties in exactly mapping historic expenditures to newly standardised expenditure categories and to do so may not be cost-effective. Retrospectively mapping historical expenditures into new standardised cost categories could require significant effort and result in costs being assigned to categories arbitrarily.

K3.28 A transitional measure in respect of the provision of historical information is therefore considered appropriate. This was supported by submitters.¹⁴¹⁵ The transitional arrangements adopted are designed to minimise the costs associated with moving to a standardised framework over time.

K3.29 These arrangements provide an option for the applicant to report its historical expenditure using its own expenditure categories and its forecast expenditure using both its own and the standard categories. This option will apply for CPP proposals made on or before 31 March 2016 for all services, which provides at least five years (from when IMs take effect) for suppliers to transition to the standardised expenditure categories.

¹⁴¹⁴ Type I risks are risks that are generally unrelated to the day-to-day operations of the firm, and arise through infrequent events that could produce large losses. Examples include natural disasters; pandemics; terrorist threats; or large, unexpected policy shifts that could force the shutdown of operating plant before the end of its economic life.

¹⁴¹⁵ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 55, paragraph 214; PricewaterhouseCoopers, *Post-Workshop Submission on Input Methodologies (Electricity Distribution) Emerging Views Paper - Customised Price-Quality Path Capex/Opex Information Requirements, made on behalf of 21 Electricity Distribution Businesses*, 19 April 2010, p. 11, paragraphs 30-31; Powerco Limited, *Post-Workshop Submission Customised Price-Quality Path*, 19 April 2010, p. 13, paragraphs 58-59.

K4 Verification

Overview

K4.1 This section discusses the independent verification of CPP proposals in more detail.

Requirements to be met by the supplier –verification

Engagement of verifier

- K4.2 An applicant must attach an independent verifier’s report to its proposal. The verifier¹⁴¹⁶ must be engaged in accordance with the process set out in Schedule F of the IM Determinations. The key task of the verifier is to provide a verification report in respect of the proposal to be prepared in accordance with the terms of reference specified in Schedule G of the IM Determinations.
- K4.3 In summary, the process for engaging the verifier is that an applicant must propose a verifier or a selection of verifiers for the Commission to choose from. To receive the Commission’s approval, the verifier must be sufficiently independent from the applicant, and sufficiently qualified and experienced to assess the proposal, in accordance with criteria specified in the IM Determinations. The verifier may not act as an auditor or advisor to the applicant in relation to any other aspect of the CPP proposal.
- K4.4 Once approval has been received, the applicant must enter into a tripartite deed with the Commission and the verifier. The key deliverable under that deed will be the verification report. A tripartite deed arrangement has been adopted because the Commission considers that this is the best way to clearly set out the respective obligations and roles of each of the parties.
- K4.5 Under the terms of the deed, the verifier will be expected to prepare a verification report, and be available to answer the Commission’s questions on that report. It will also be required to owe a duty of care to the Commission. This will help to ensure that the verifier is truly independent of the applicant and is being engaged to provide a professional expert opinion on the proposal.
- K4.6 The applicant will have the opportunity to revise its proposal in light of the verification report before it submits its proposal to the Commission. The verifier must prepare a draft verification report for this purpose. The information that is submitted as part of a CPP proposal that is relevant to the verifier’s Terms of Reference must have been reviewed by the verifier before it is submitted to the Commission. For the avoidance of doubt, the applicant may decide not to submit its proposal at any time (even following the preparation of the verification report), but may not withdraw its proposal once it has been submitted.

¹⁴¹⁶ In the IM Determinations, the verifier is defined, inter alia, as a “person” as that term is defined in the Act. This means that the verifier may be an individual, a body corporate, or an unincorporated body. A verifier that is not an individual may nevertheless specify a “designated individual” (or individuals) to undertake the work. Such individuals must also meet the independence criteria set out in the determination. This enables a company, for example, to identify those with specialist expertise that it wishes to be involved in the verification process and to have those individuals pre-approved as part of the engagement process.

Role of verifier

- K4.7 The verifier must consider those aspects of the CPP proposal that are relevant to its Terms of Reference and may not consider material relevant to other parts of the CPP proposal. One of the key roles of the verifier will be to select identified projects or programmes for detailed assessment, in accordance with the requirements.
- K4.8 Similarly, the verifier may only request additional information of the CPP applicant if that information is relevant to the Terms of Reference.
- K4.9 The verifier must make any extrinsic materials it uses in making its verification report available to the CPP applicant for comment, subject to any confidentiality concerns that arise in relation to that third-party material.

Scope of verification report

- K4.10 The verification report must cover the matters set out in the terms of reference. It must set out the verifier's opinion on (among other things):
- whether the CPP applicant's service category definitions appropriately describe all activities undertaken for the purpose of supplying the regulated services;
 - whether the opex forecast and forecast values of commissioned assets have been provided in accordance with the requirements;
 - whether the policies, planning standards and key assumptions relied upon in determining the capex and opex forecasts are sufficient to meet the expenditure objective;
 - whether the forecast of capital contributions is reasonable and consistent with other aspects of the CPP proposal;
 - whether the key assumptions, key input data and forecasting methods used in determining the demand forecasts were reasonable and it was appropriate to use the resulting demand forecasts to determine the capex and opex forecasts;
 - the areas of the proposal the Commission should focus on when undertaking its assessment; and
 - any information identified in the proposal that would assist the Commission's assessment.
- K4.11 The assessment techniques that can be used by the verifier include:
- engineering and management techniques: including trending or time-series analysis, expenditure category benchmarking, high level governance and process review, project and programme sampling, process or functional modelling, unit rate benchmarking, internal benchmarking of forecast costs against historic costs; and

- economic techniques: including critiques (or independent development of) demand forecasts, labour unit cost forecasts, materials forecasts, plant forecasts and equipment unit cost forecasts.

K4.12 The information provided by an applicant should enable application of these techniques, as relevant to the proposal. It is not possible to mandate which of these techniques the verifier (or the Commission) will apply in its assessment of proposals, as that will depend on the nature of the proposal. The verifier must explain why particular techniques were applied and others were not. Interested parties did not raise any significant concerns with the application of these techniques, apart from concerns regarding the use of benchmarking against other regulated suppliers.¹⁴¹⁷ The Commission recognises that there are likely to be limitations on data to undertake extensive benchmarking against other suppliers. Furthermore, where the verifier relies on additional information (for the purpose of applying the assessment techniques) it must provide that information to the supplier¹⁴¹⁸ and take into account any comments the supplier makes about its use.

K4.13 As discussed in Section K1, the applicant will be required to pay the verifier's fees, but will be entitled to recover 100% of those costs from consumers (provided the proposal is not discontinued by the Commission under s 53S).

Reliance on verifier

K4.14 Submitters have argued that the Commission should: rely on the verifier's opinion; not seek to substitute its own opinion or the advice of its own expert advisers for the verifier's opinion; and not duplicate the work undertaken by the verifier.¹⁴¹⁹ ENA suggested that the Commission should commit to using the information certified by the verifier for the purposes for which it was submitted, unless it could demonstrate that using other information would be materially better in meeting the Part 4 purpose statement.¹⁴²⁰ However, the Commission will need to undertake its own assessment of the proposal in order to make a s 52P determination. In doing so, to the extent practicable, the Commission will seek to avoid duplication of effort and to rely on the professional opinion expressed by the verifier.

K4.15 ENA proposed that verifiers be required to sign up to the High Court Code of Conduct for expert witnesses.¹⁴²¹ The Commission considers that this proposal may be designed to increase the degree of reliance the Commission feels able to place on the verifier's opinion. However, the Commission considers that this adds little to the

¹⁴¹⁷ Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 18; Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 54, paragraph 210.

¹⁴¹⁸ Unless the verifier's terms of use of the information prevent its disclosure.

¹⁴¹⁹ Powerco Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 9, paragraph 33; Vector Limited, *Submission on EDBs and GPBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 25 August 2010, p. 21, paragraph 72 and p. 50, paragraph 193.

¹⁴²⁰ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 82, paragraph 326.

¹⁴²¹ Electricity Networks Association, *Submission on EDBs (Input Methodologies) Draft Determination and Reasons Paper, Customised Price-Quality Path Requirements*, 23 August 2010, p. 82, paragraph 326.

existing independence requirements as set out in the IM Determinations. The Commission has, therefore, not included this requirement.

Treatment of verification report if proposal deferred

K4.16 The initial pre-submission verification report will remain valid only in respect of the information that was contained in the initial proposal (i.e. before it was updated) and that is relevant to the verifier's Terms of Reference. The Commission intends that a supplementary verification report will be required in the event the Commission requires or the CPP applicant seeks to make any changes to the proposal in respect of matters relevant to the verifier's Terms of Reference. The Commission also intends that:

- the report could be prepared either by the person who verified the initial proposal, or by a different person;
- any new verifier would be required to be engaged in accordance with the verifier engagement framework set out in Schedule F of the IM Determinations;
- the applicant would be required to give any new verifier a copy of the initial verification report for its information; and
- any supplementary verification report would be made in accordance with the initial terms of reference.