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Proposed amendment to the WACC percentile for electricity lines services and gas pipeline services

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Regulation Branch
Commerce Commission

Contents

List of abbreviations used

CGE	Computable general equilibrium
CPP	Customised price-quality path
DPP	Default price-quality path
EDB	Electricity distribution business
GPB	Gas pipeline business
IMs	Input methodologies
IPP	Individual price-quality path
IRIS	Incremental rolling incentives scheme
MEUG	Major Electricity Users Group
NPV	Net present value
RAB	Regulatory asset base
TAMRP	Tax adjusted market risk premium
UBA	Unbundled bitstream access
UCLL	Unbundled copper local loop
WACC	Weighted average cost of capital

Executive Summary

X1 This paper explains the reasons for our draft decision on the appropriate percentile estimate of the weighted average cost of capital (WACC) that will apply to energy businesses regulated under Part 4 of the Commerce Act. It describes our view regarding the appropriate percentile of the WACC distribution for price-quality path and information disclosure regulation, to be used under the cost of capital input methodologies (IMs).

X2 Our draft decision is that the specified WACC for energy businesses should be amended, in light of evidence we have gathered since the IMs were first determined in December 2010. Our decision is that:

X2.1 the 67th percentile of our estimated WACC distribution should be used for price-quality path regulation (the 75th percentile is currently used); and

X2.2 a range from the 33rd to 67th percentile of our estimated WACC distribution should be used for information disclosure regulation (the 25th to the 75th percentile is currently used).

We have reconsidered the WACC percentile following the High Court's IMs judgment

X3 The cost of capital IMs specify how we will estimate the WACC for regulated businesses. The WACC applied under the cost of capital IMs is an estimate, because the actual cost of capital is not observable. Consequently, our WACC estimate under the cost of capital IMs could be higher or lower than the true cost of capital.

X4 The cost of capital IMs currently specify a WACC above the mid-point estimate for price-quality paths because we expected the social costs of under-estimating WACC to be greater than the social costs of over-estimating WACC, given the uncertainty in estimating WACC. Our expert advisors at the time of the original IMs decision supported using a WACC above the mid-point.

X5 Our previous decision to use the 75th percentile for price-quality path regulation was a matter of judgement. At the time of our original decision we had limited empirical or analytical information to assist us in determining the specific WACC percentile, including on the likely response of regulated businesses (in terms of their investment behaviour) to the WACC estimates that would result from application of the cost of capital IMs.

X6 Use of the 75th percentile WACC estimate for price-quality path regulation was challenged in merits appeals to the High Court. In particular, the Major Electricity Users' Group (MEUG) argued that the mid-point WACC estimate should be used (or alternatively, the 75th percentile should be applied to new investment only).

X7 In its judgment on the IMs merits appeals, the High Court had some sympathy with MEUG's position based on the lack of evidential support for the 75th percentile. While the Court did not find that a lower percentile was materially better, it stated its expectation that we would re-examine this issue when we next review the IMs.

X8 Following the Court's judgment, several consumer groups requested that we urgently review the cost of capital IMs.[1] The consumer groups suggested that uncertainty regarding the WACC percentile will remain until investors know our views regarding the issues raised by the High Court, reducing the positive investment incentives associated with the 75th percentile in the interim.

X9 An urgent review was requested so that any amendments to the WACC percentile can apply to the next five-year regulatory period for electricity distribution businesses and Transpower, which begins on 1 April 2015.[2] This is necessary to avoid a situation where the prices faced by consumers continue to reflect the 75th percentile WACC for the next five years, but no investment benefit is obtained.

We have gathered significant new evidence in response to the Court's judgment

X10 In response to the Court's judgment, we have gathered a considerable amount of new analytical and empirical evidence to assist in forming our view regarding the appropriate WACC percentile. This evidence was not previously available to us when first determining the IMs in December 2010, or to the Court during the IMs merits appeals.

X11 The evidence we have collected includes:

X11.1 relevant academic literature, notably a paper by Professor Ian Dobbs regarding welfare loss asymmetries arising from uncertainty in the regulatory WACC;

X11.2 independent reports prepared by our expert advisors: Oxera, Professor Ingo Vogelsang, Professor Julian Franks, Dr Martin Lally, and Economic Insights; and

X11.3 expert reports submitted on behalf of interested parties, in response to consultation papers we released.

X12 We now also have experience operating under the IMs we determined in 2010. We have been able to observe the investment of regulated businesses under the 75th percentile WACC, and other relevant market information, when forming our view regarding the WACC percentile.

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1 The consumer groups that requested an urgent review of the cost of capital IMs were MEUG, Consumer NZ, the Employers and Manufacturers Association Northern (EMA) and the Board of Airline Representatives New Zealand (BARNZ).

2 The price-quality path resets for EDBs and Transpower are due to be determined by the end of November this year.

X13 Consequently, we are now in a position to make a more informed decision regarding the appropriate WACC percentile than when the IMs were originally determined. We now have significantly more information than was available to us when setting the original cost of capital IMs.

Judgement is required when determining the appropriate WACC percentile

X14 Although we now have substantially more information, judgement is still required when deciding the appropriate WACC percentile.

X15 There are several key relationships which directly influence the 'optimal' WACC percentile, but which are subject to fundamental uncertainty. For example, it is extremely difficult to empirically estimate the link between the WACC allowed by the regulator, the level of investment by regulated suppliers, and how this affects quality of service.

X16 Additional work will not resolve all of the uncertainty surrounding these key relationships. Although we now have significantly more information to assist us in making a decision, we must still exercise judgement when selecting the WACC percentile.[3] However, the information we have gathered has helped narrow the scope of judgement required when selecting the WACC percentile.

The 67th percentile WACC is appropriate for price-quality path regulation

X17 In our view, it is appropriate to use a WACC significantly above the mid-point estimate for price-quality path regulation. This is because the potential costs of under-investment from a WACC that is too low are likely to outweigh the harm to customers (including any over-investment) arising from a WACC that is too high.

X18 The available evidence provides substantial support for using a WACC above the mid-point. In summary:

X18.1 all our independent expert advisors who commented on this issue agree that a WACC above the mid-point should be used;

X18.2 there have been a large number of submissions, and expert reports submitted by interested parties, which provide analytical (and some empirical support) for using a percentile above the mid-point; and

X18.3 overseas regulators often exercise judgement by adopting a WACC above the mid-point of the range, sometimes by using estimates of individual parameters which are generous in favour of suppliers.

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3 As far as we are aware, no other regulator has ever attempted to empirically estimate the optimal WACC percentile. Rather, regulators typically apply judgement when selecting a WACC within the reasonable range they have defined.

X19 On balance, we consider that the evidence we have collected suggests that the WACC for price-quality path regulation should sit somewhere between the 60th percentile and 75th percentile that currently applies under the IMs.

X20 However, there is evidence that the WACC should be reduced below the 75th percentile estimate.

X20.1 The enterprise values for Powerco and Vector (as implied by AMP Capital's acquisition of a minority stake in Powerco, and Vector's equity market valuation plus net debt), are significantly greater than the corresponding regulatory asset base (RAB) values.[4] This strongly suggests that the allowed rate of return, based on the 75th percentile estimate, is more than sufficient to compensate investors for putting their capital at risk.

X20.2 Oxera has recommended using a WACC below the 75th percentile estimate, based on empirical analysis of the expected losses to consumers from under- and over-estimating the true cost of capital (at various percentiles of the WACC distribution). Oxera's report adopts the loss function approach supported by the Court, and has been peer-reviewed by Professor Vogelsang.[5] We have drawn on Oxera's framework, and other relevant factors, when forming our conclusions regarding the WACC percentile.

X20.3 Professor Vogelsang has noted if the current level of investment is optimal, the impacts of changes in investment on reliability are likely to be relatively minor. While we do not know if current investment levels are optimal, strong investment has been occurring (and is forecast to continue to occur) and there is no evidence that it is inadequate to satisfy consumers' needs.

X20.4 There are other tools to help incentivise efficient investment from regulated suppliers, in addition to the WACC percentile. For example, required quality standards (and associated penalties) help reduce the risk of under-investment. We are able to monitor the investment of regulated businesses and take action if we become concerned about under-investment or declining quality of service.

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4 Powerco and Vector together comprise 40.7% of the total RAB for EDBs.

5 Professor Vogelsang identified several off-setting considerations which may affect the conclusions of Oxera's analysis but, on balance, we place weight on Oxera's view that a percentile below the 75th is appropriate.

X20.5 A range of other factors, including investors' long-term ownership interests, suppliers' need to credibly forecast expenditure in future price resets, and the desire of Board and management to ensure the lights do not go out, also combine to produce incentives to invest efficiently. In our view, continued use of the 75th percentile estimate would place too much emphasis on the WACC as the source of incentives to invest, relative to the contribution from these other factors.

X21 Based on the available evidence, our judgement is that the 67th percentile WACC estimate is more appropriate for price-quality path regulation than the 75th percentile estimate. In our view, a percentile around the middle of the reasonable range we have defined (ie from the 60th to the 75th percentile) appropriately balances the relative costs to consumers of under- and over-investment.

X22 Although there is some evidence pointing to a WACC lower than the 67th percentile estimate, we consider that some conservatism is appropriate given that the long-term costs to consumers of under- and over-estimating WACC are asymmetric, so erring on the higher side is in their interests.

X23 We have considered interdependencies with other aspects of the regulatory regime when deciding that the WACC should be reduced from the 75th to the 67th percentile estimate. In our view, there is not such a direct link between the WACC percentile and the other parameters of the IMs that the percentile cannot be amended at this time.[6] The percentile was, and continues to be, the last decision made regarding the WACC (after reaching a view on all other parameters).

A range from the 33rd to 67th percentile is appropriate for information disclosure regulation

X24 Under the cost of capital IMs, a WACC range is used for information disclosure regulation. The current range is symmetric around the mid-point WACC estimate, and is bounded by the 25th and 75th percentile WACC estimates.

X25 Our view remains that the WACC range for information disclosure regulation should be symmetric around the mid-point. Consistent with the reduction in the WACC percentile for price-quality path regulation, we consider that the WACC range for information disclosure for energy businesses should be from the 33rd to the 67th percentile.

6 Further, we consider that any potential bias in the mid-point WACC estimate, and the risks of catastrophic events, do not require continued use of the 75th percentile.

The WACC percentile for airports will be addressed separately

X26 This draft decision addresses the WACC percentile for regulated energy businesses only.[7] Given that the price-quality paths for EDBs and Transpower are being reset later this year, we have focused on energy businesses at this stage.[8]

X27 Submissions, and advice from some of our experts, have raised several airport-specific considerations which may affect the appropriate WACC percentile for specified airport services (including, in particular, the role of using a 'dual-till' approach to regulation). We have not yet fully considered the airport-specific aspects of submissions at this stage.

X28 Therefore, we are taking additional time to consider the WACC percentile for specified airport services. We will release a process update paper on the WACC percentile for airports in due course.

We invite submissions on our draft decision

X29 You are invited to provide your views on any aspect of our draft decision. Submissions are due by **5pm Friday 29 August 2014**, and cross-submissions are due by **5pm Friday 12 September**. Submissions should be e-mailed to Brett Woods (Senior Analyst, Regulation Branch), c/o regulation.branch@comcom.govt.nz.

X30 After considering your views, we then intend to reach a final decision on the WACC percentile for electricity lines and gas pipeline services by 31 October 2014.

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7 This decision applies equally to EDBs, Transpower and gas pipeline businesses (GPBs). We have not identified compelling reasons for using a different percentile for these sectors.

8 We are currently undertaking separate work on the WACC for two regulated telecommunications services the unbundled copper local loop (UCLL) and unbundled bitstream access (UBA) services. See http://www.comcom.govt.nz/regulated-industries/telecommunications/regulated-services/standard-terms-determinations/unbundled-copper-local-loop-and-unbundled-bitstream-access-services-final-pricing-principle for further information regarding the UCLL and UBA pricing reviews.

1. Introduction

Purpose of this paper

1.1 This paper outlines our draft decision on the appropriate weighted average cost of capital percentile for electricity lines and gas pipeline businesses regulated under Part 4 of the Commerce Act.[9] Our draft decision responds to the High Court's comments regarding the WACC percentile, expressed in its input methodologies judgment.[10]

1.2 You are invited to provide your views on this draft decision.

1.2.1 Submissions are due by 5.00pm, 29 August 2014.

1.2.2 Cross-submissions are due by 5.00pm, 12 September 2014.

1.3 We expect to reach a final decision on the WACC percentile by 31 October 2014.

Approach to the WACC percentile in our 2010 IMs determinations

1.4 Under the current cost of capital input methodologies (IMs) we estimate a mid-point weighted average cost of capital (WACC) and a standard error of the WACC. The standard error of the WACC incorporates the standard errors of asset beta, the debt premium, and the tax adjusted market risk premium (TAMRP). It is used to estimate the distribution of WACC.

1.5 We select a percentile of the WACC distribution for price-quality path regulation (the WACC percentile).[11] Currently we apply the 75th percentile. A WACC range from the 25th to the 75th percentile is specified for information disclosure regulation.

1.6 We originally specified use of a WACC for price-quality paths that is above the mid-point estimate because we expected the social costs of a WACC that is too low to be greater than the social costs of using a WACC that is too high (given the uncertainty in knowing what the true WACC is).[12]

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9 As noted in our process update paper on 23 June 2014, this draft decision does not apply to airport services regulated under Part 4 of the Commerce Act, see Commerce Commission "Further work on cost of capital input methodologies: Process update" (23 June 2014).

10 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013].

11 The High Court in its merits appeals decision, and several submitters highlight that the distribution from which the percentile is chosen is not a true statistical distribution. We agree, however, we consider that it represents a reasonable estimate of the likely estimation errors. We use the term 'WACC percentile' as a short-hand only, not in its true statistical meaning.

12 Commerce Commission "Input methodologies (Electricity Distribution and Gas Pipeline Services): Reasons Paper" (December 2010), paragraph H13.44.

1.7 We noted that the WACC percentile "is a matter of judgement" and our use of the 75th percentile estimate reflected:[13]

1.7.1 the view that under-estimating WACC when setting price-quality paths would damage dynamic efficiency, creating a more severe cost to consumers in the long run than the costs to consumers from over-estimating WACC;[14]

1.7.2 the Part 4 Purpose (the long-term benefit of consumers);

1.7.3 the uncertainty in estimating the true cost of capital; and

1.7.4 that in workably competitive markets not all risks can be passed on to the consumer in the form of higher prices. Instead, in workably competitive markets firms have to manage some risks.[15]

High Court's comments regarding the WACC percentile

1.8 The Major Electricity Users' Group (MEUG) challenged our use of the 75th percentile WACC in the merits appeals to the High Court. MEUG argued that the mid-point WACC estimate should be used (or alternatively, the 75th percentile be applied to new investment only).

1.9 Airports, on the other hand, argued that the 75th percentile WACC estimate is too low, and they should be required to report against the 75th to 85th percentile range (or an upper band materially higher than the 75th percentile).[16]

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13 Commerce Commission "Input methodologies (Electricity Distribution and Gas Pipeline Services): Reasons Paper" (December 2010), paragraph H11.65.

14 Commerce Commission "Input methodologies (Electricity Distribution and Gas Pipeline Services): Reasons Paper" (December 2010), paragraph 6.7.12.

15 A number of submissions have asserted that our 2010 decision to select the 75th percentile is related to other parameter decisions, such as model error and asymmetric risk. We respond to those submissions at paragraph 4.13.

16 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraph 1425. Transpower also argued for the 90th percentile in its notice of appeal and written submissions, but not in oral submissions. The Court therefore did not consider this submission further, see paragraph 1424.

1.10 In considering the WACC percentile, the Court:

1.10.1 was sceptical that using a point substantially higher than the mid-point was necessary to incentivise investment,[17] and stated that no analysis was provided to support this assertion;[18]

1.10.2 sympathised with MEUG's submission that the use of the 75th percentile lacked a solid basis;[19]

1.10.3 noted that there was nonetheless, strong (but not evidenced) expert support for the 75th percentile; [20]

1.10.4 noted that the in-principle objections to deliberately erring on the side of over-estimating the WACC suffered from the same lack of empirical support as our approach;[21]

1.10.5 noted that, in establishing the new regulatory regime, it is understandable that we did not wish to run the risk of deterring investment by providing a rate of return that is too low;[22]

1.10.6 was unable to be satisfied that moving away from the 75th percentile would be materially better in meeting the purpose of Part 4 and/or the purpose in s 52R;[23] and

1.10.7 stated its expectation that we will consider the Court's scepticism of using a WACC substantially above the mid-point when we review the cost of capital IMs.[24]

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17 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraphs 1479 - 1481.

18 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraphs 1462 - 1463.

19 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraph 1470.

20 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraph 1470.

21 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraph 1482.

22 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraph 1482.

23 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraphs 1483 - 1484.

24 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013] paragraphs 1486.

1.11 While the Court put forward a number of its own 'tentative' and 'in-principle' observations, its strongest view was that we needed to do further work, including:

1.11.1 seeking empirical or analytical evidence to support our asymmetric costs reasoning (eg, loss analysis[25]), or abandoning that reasoning;[26]

1.11.2 considering, and if possible estimating, the inter-sectoral effects;[27]

1.11.3 expanding the review of overseas practice;[28] and

1.11.4 considering the two-tier proposal put forward by MEUG, which sets a different WACC for new and sunk investment.[29]

1.12 This draft decision responds to the Court's call for a more evidentially based decision on the WACC percentile.

Why we are reviewing the percentile now

1.13 As noted in our 31 March 2014 process update paper, we consider it necessary to consult on an amendment to the WACC percentile now because of the uncertainty that the Court's judgment has created.[30]

1.14 We consider that this uncertainty is likely to have reduced the enhanced investment incentives we sought to achieve by using the 75th percentile WACC estimate. The risk that the WACC percentile to be applied in the future may be lower is likely to weaken the business case for new investment by regulated suppliers, who regularly make long-lived investments which last for many regulatory control periods.

1.15 If the Court's concerns regarding the WACC percentile are not addressed prior to the next price-quality path resets for electricity distribution businesses (EDBs) and Transpower, the 75th percentile will continue to apply in the next regulatory period (from 1 April 2015 to 31 March 2020). In this situation:

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25 A loss function estimates the social harm incurred by over-estimating and under-estimating the WACC and provides guidance as to where the expected harm would be minimised.

26 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013] paragraphs 1464 - 1468, and 1486.

27 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013] paragraphs 1475 - 1476.

28 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraphs 1477.

29 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraph 1486.

30 Commerce Commission "Further work on the cost of capital input methodologies: Process update and invitation to provide evidence on the WACC percentile" (31 March 2014).

1.15.1 the prices faced by consumers will continue to reflect the 75th percentile WACC for the next five years; but

1.15.2 due to investors and managements recognising the risk of a reduction in the WACC percentile that will apply in future regulatory periods, any positive investment incentives for regulated suppliers resulting from using the 75th percentile are likely to be diminished.

1.16 We received requests from several consumer groups arguing on grounds similar to the above analysis that we should address the Court's concerns before the price-quality path resets for EDBs and Transpower later this year.[31] The consumer groups argued that failing to do so would mean consumers pay higher prices for another five years, because the next statutory review of the IMs will not be completed until after those resets.[32]

Our draft decision reflects the evidence and submissions received to date

1.17 We now have a significantly greater body of evidence on the WACC percentile than previously available to us and the Court. We have invited two rounds of submissions, commissioned several expert reports, and conducted our own analysis.

1.18 We began further work on the WACC percentile in February 2014. Our first paper sought views on whether we should consider reviewing or amending the cost of capital IMs.[33] We received a number of submissions on this question from consumers and suppliers of services regulated under Part 4.

1.19 Following consideration of submissions received, we decided to proceed with further work on a potential amendment. In March 2014 we issued a notice of intention to do further work on the cost of capital IMs and also invited further submissions providing evidence regarding the appropriate WACC percentile. Expert submissions received in this round are summarised in Chapter 5, and are addressed in more detail in Oxera's review of submissions published alongside this paper.[34]

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31 Board of Airline Representatives New Zealand Inc "Request for Review of Cost of Capital Input Methodology" (23 December 2013); and Consumer NZ, Employers and Manufacturers Association Northern Inc, and Major Electricity Users Group Inc "Energy Prices and Urgent Review of Cost of Capital Input Methodology" (19 December 2013).

32 Commerce Act 1986, s52Y.

33 Commerce Commission "Invitation to have your say on whether the Commerce Commission should review or amend the cost of capital input methodologies" (20 February 2014).

34 Note that submissions on our March 2014 process update paper that were received after 5 May 2014 were not considered in our draft decision. We will consider these early submissions alongside other submissions on this paper.

1.20 We also commissioned further expert work to assist in forming our view regarding the appropriate WACC percentile. We requested independent advice from the following experts, whose reports are now available on our website.[35]

1.20.1 **Oxera:** developed a framework for identifying the appropriate WACC percentile, using available quantitative evidence. They have also produced a review of expert submissions, which we have published alongside this paper.

1.20.2 **Professor Ingo Vogelsang:** conducted a peer-review of Oxera's report, and provided an additional report containing further thoughts on the WACC percentile. He will also be publishing a review of our draft decision in the coming days.

1.20.3 **Professor Julian Franks:** provided further explanation of the reasons for his previous recommendations on setting the WACC above the mid-point of the range, as well as being involved in Oxera's advice.

1.20.4 **Dr Martin Lally:** conducted a review of relevant literature regarding the WACC percentile, and provided further explanation of the reasons for his previous recommendations on setting the WACC above the mid-point of the range.[36]

1.20.5 **Economic Insights:** conducted a review of overseas regulatory decisions, focusing on whether other regulators use WACC estimates above, below, or at the mid-point of the range.

1.21 We also conducted analysis ourselves. In particular, we considered:

1.21.1 the relevant literature - notably, a 2011 paper by Professor Ian Dobbs, which was not available when the IMs were first set;[37]

1.21.2 available evidence on investor valuations of regulated businesses, relative to their regulatory asset bases (RAB);

1.21.3 observed level of investment of regulated businesses under the IMs to date; and

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35 See http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/further-work-on-wacc/

36 In 2008 we received a recommendation on the WACC percentile from Professor Stewart Myers, as well as Professor Franks and Dr Lally. We did not commission Professor Myers to provide further explanation of his 2008 views, as we were primarily seeking new analyses and empirical work from our experts (which Professor Franks and Dr Lally were both directly involved in).

37 Dobbs, I., 2011. Modelling Welfare Loss Asymmetries Arising from Uncertainty in the Regulatory Cost of Finance, Journal of Regulatory Finance 39, 1-28.

1.21.4 the balance of the regulatory regime in light of the expected incentives to invest in network assets.[38]

Scope of this draft decision

1.22 Consistent with the notice of intention, this draft decision is limited to the WACC percentile.[39] Amendments to other aspects of the cost of capital IMs will be considered as part of the wider IMs review that we are required to complete before December 2017.

1.23 However, in reaching our draft decision, we have considered relevant interdependencies. This includes interdependencies with other aspects of the IMs, but also wider interdependencies with decisions made in the regulatory instruments themselves (eg, price-quality paths), such as the role of quality standards, and investment incentives.

Our draft decision addresses the WACC percentile for electricity lines and gas pipeline services

1.24 Most of the evidence gathered to date on the WACC percentile has been on electricity businesses. We consider this appropriate because price-quality paths for EDBs and Transpower are being reset later this year. This will be the first time that any amended WACC percentile could be applied to a price-quality path.

1.25 This draft decision applies equally for EDBs and Transpower. We have considered the specific points raised in respect of Transpower but, in our view these differences are not significant enough to justify a different percentile.[40]

1.26 This draft decision also covers gas pipeline businesses. While we accept that there may be differences in the evidence between the electricity lines and gas pipelines sectors, we consider these services to be similar enough for the same percentile to apply.[41]

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38 Commerce Commission "Regulatory Incentives and the Cost of Capital: Working Paper" (23 June 2014).

39 Commerce Commission "Notice of intention 31 March 2014: Potential Amendments to Input Methodologies for Electricity Distribution Services, Gas Pipeline Services, Airports, and Transpower" (31 March 2014).

40 We specifically discuss these differences in paragraphs 6.46 to 6.47.

41 This aligns with comments made by both Dr Lally and Professor Vogelsang, who argue that applying the same margin across industries may be beneficial to improve simplicity and practicality. See Dr Martin Lally "The Appropriate Percentile for the WACC Estimate" (19 June 2014), page 16; and Professor Ingo Vogelsang "On the economic effects of allowing a WACC above the midpoint" (12 June 2014), pages 5-6.

We will consult on the appropriate WACC percentile for airports at a later date

1.27 This draft decision does not cover specified airport services regulated under Part 4. This is because some of the submissions and expert advice we have received indicate that different WACC percentiles may be appropriate for airports (where a dual-till approach to regulation applies). These differences require further consideration, so we intend to consult on the appropriate percentile for airports at a later date.

1.28 However, the current consultation will be relevant to our future work on the percentile for airports. We therefore, encourage parties interested in airports regulation to continue to be involved through this process.

Determinations affected by our draft decision

1.29 Following the discussion above, the specific determinations affected by this draft decision are:

1.29.1 *Electricity Distribution Services Input Methodologies Determination 2012* [2012] NZCC 26;[42]

1.29.2 *Transpower Input Methodologies Determination* [2012] NZCC 17;[43]

1.29.3 *Gas Distribution Services Input Methodologies Determination 2012* [2012] NZCC 27;[44] and

1.29.4 *Gas Transmission Services Input Methodologies Determination 2012* [2012] NZCC 28.[45]

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42 For the most recent consolidated version of this determination please refer to our website at: http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/electricity-distribution/

43 For the most recent consolidated version of this determination please refer to our website at: http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/transpower-input-methodologies/

44 For the most recent consolidated version of this determination please refer to our website at: http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/gas-pipelines-2/

45 For the most recent consolidated version of this determination please refer to our website at: http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/gas-pipelines-2/

Structure of this paper

1.30 The main body of this paper has five more chapters.

1.30.1 Chapter 2 provides the framework we have used for coming to our draft decision.

1.30.2 Chapter 3 sets out the problem the WACC percentile is intended to address.

1.30.3 Chapter 4 explains why we consider that we can make a decision on the WACC percentile now.

1.30.4 Chapter 5 discusses the case for using a WACC above the mid-point estimate.

1.30.5 Chapter 6 sets out our draft decision on the appropriate WACC percentile for gas pipeline services, and electricity lines services.

1.31 The paper also has four attachments.

1.31.1 Attachment A provides details of our analysis of RAB multiples.

1.31.2 Attachment B discusses the reasonableness tests we have conducted.

1.31.3 Attachment C sets out a stylised example of the costs to consumers of an uplift in WACC when costs are high relative to benefits.

1.31.4 Attachment D sets out the specific amendments we propose to make to the IM determinations.

1.31.5 Attachment E sets out what we consider to be the record for this proposed amendment.

How you can provide your views

1.32 You are invited to provide your views on any aspect of this paper. However, we would like to draw your attention to the request for information on the probability of outages, as discussed in paragraph 5.23.2.

1.32.1 Submissions are due by 5pm, Friday, 29 August 2014.

1.32.2 Cross-submissions are due by 5pm, Friday 12 September 2014.

1.33 We do not intend to take into account any material that is submitted outside of the timeframes provided. Any party that is concerned about the time to engage with the material should contact us with a request for an extension outlining their specific concerns.

Address for responses

1.34 You should address your responses to:

1.34.1 Brett Woods (Senior Analyst, Regulation Branch)

1.34.2 c/o regulation.branch@comcom.govt.nz

1.35 It would be helpful to include in the subject heading 'Submission on Further Work on the Cost of Capital Input Methodologies'.

1.36 We request that responses are provided in both MS Word and PDF file formats.

How we will treat submissions relating to the telecommunications WACC

1.37 We are currently undertaking separate work on the WACC for two regulated telecommunications services: the unbundled copper local loop (UCLL) and unbundled bitstream access (UBA) services.[46] There is potential for overlap between the issues and material being considered in the cost of capital IMs WACC percentile process, and the UCLL and UBA WACC processes.

1.38 In order to maintain a clear understanding of what constitutes the record for this proposed amendment we set out below how we intend to treat submissions on this related work. Our specific understanding of the record is set out further in Attachment E.

1.39 As the cost of capital IMs process is being conducted on different timelines and under different legislation to the UBA and UCLL processes, our view is that it should operate separately. This means that, except where we expressly say otherwise, we do not propose to have regard to submissions from:

1.39.1 the cost of capital IMs process in the UCLL and UBA processes; and

1.39.2 the UCLL and UBA processes in the cost of capital IMs process.

1.40 Where we incorporate submissions from one process into another, we will ensure that parties interested in the second process have an opportunity to give their views on those submissions.[47]

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46 See http://www.comcom.govt.nz/regulated-industries/telecommunications/regulated-services/standard-terms-determinations/unbundled-copper-local-loop-and-unbundled-bitstream-access-services-final-pricing-principle/ for further information on the UCLL and UBA pricing reviews.

47 For example, our 7 March 2014 technical consultation paper on the WACC for UCLL and UBA expressly incorporated documents from the cost of capital IMs process into the UCLL and UBA process. Commerce Commission "Determining the cost of capital for the UCLL and UBA price reviews: Technical consultation paper" (7 March 2014), page 6, paragraph 13.

1.41 Our approach to the interaction between the cost of capital IMs process and the UCLL and UBA processes may result in parties making similar submissions in multiple processes. However, we consider it is preferable that parties in all processes are clear about exactly what submissions we are considering when making our decisions.

Requests for confidentiality

1.42 While we discourage requests for non-disclosure of submissions, we recognise that there may be cases where parties that make submissions wish to provide information in confidence. We offer the following guidance.

1.42.1 If it is necessary to include confidential material in a submission, the information should be clearly marked. Both confidential and public versions of the submission should be provided.

1.42.2 The responsibility for ensuring that confidential information is not included in a public version of a submission rests entirely with the party making the submission.

1.43 We request that you provide multiple versions of your submission if it contains confidential information or if you wish for the published electronic copies to be 'locked'. This is because we intend to publish all submissions and cross-submissions on our website. Where relevant, please provide both an 'unlocked' electronic copy of your submission, and a clearly labelled 'public version'.

Next steps

1.44 We will issue a consultation paper in August 2014 that will propose changing the date the WACC is estimated from 30 September to 31 October. This would only apply to the WACC determined for the electricity distribution default price-quality path, and for Transpower's individual price-quality path.[48] This change would allow us the maximum possible time to consider submissions and come to a final decision on the WACC percentile.

1.45 This consultation will not propose a change to the August "measurement window" used to calculate the determinants of WACC for the upcoming regulatory period. That is, the Commission will retain August as the relevant "measurement window" for estimating the risk-free rate, and debt premium.

1.46 If we amend the date the WACC is determined, we will then publish a final decision on the WACC percentile for electricity lines services, and gas pipeline services by 31 October 2014.

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48 This was signalled in our March process update paper. See Commerce Commission "Further work on the cost of capital input methodologies: Process update and invitation to provide evidence on the WACC percentile" (31 March 2014).

2. Framework for our draft decision on the WACC percentile

2.1 This section describes the framework we have used in making our draft decision on the appropriate WACC percentile.

Statutory context for our draft decision

2.2 The IMs for each sector regulated under Part 4 of the Commerce Act were required to be set by the end of December 2010.[49] That included IMs relating to the cost of capital.[50] The WACC percentile is one aspect of the cost of capital IMs.

2.3 As with all input methodology decisions, the WACC percentile set by the Commission must be consistent with both the purpose of Part 4 and the purpose of IMs.[51]

2.4 The Commission is able to amend IMs, by making a material change, provided that it follows the statutory process.[52] The Commission issued its notice of intention to do further work on the WACC percentile in March this year under this amendment power.

The questions we had to answer

2.5 As set out at paragraphs 1.10 to 1.11, the Court was not satisfied that our 2010 decision on cost of capital range was supported by appropriate evidence.

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49 Commerce Act 1986, s52U. A six month extension to the 30 June 2010 deadline was granted by the Minister of Commerce on 10 December 2009.

50 Commerce Act 1986, s52T(1)(a)(i). The regulated airports unsuccessfully argued that the Commission should not have set cost of capital IMs for airports in the High Court: see Commerce Commission "Input methodologies (Electricity Distribution and Gas Pipeline Services): Reasons Paper" (December 2010), paragraphs 1125 - 1149.

51 Commerce Act 1986, s52A and s52R.

52 Commerce Act 1986, s52X.

2.6 The consequence of the Court's judgment is that the Commission's previous choice of the 75th percentile does not logically have any special standing as the status quo.[53] We have therefore approached the evidence afresh,[54] and re-asked the fundamental questions relating to the WACC percentile:

2.6.1 is there any reason to depart from the mid-point ie, the best parameter based estimate we have of the cost of capital?

2.6.2 if so, what is the most appropriate percentile?

2.7 In making our draft decision, we have drawn from a range of empirical and analytical evidence, as well as observed investor and supplier behaviour. We are satisfied that our draft decision is evidentially robust.[55] However, where the evidence does not provide a consistent and unequivocal answer, or only indicates a range of appropriate answers, the Commission inevitably had to use its judgement in balancing the evidence and reaching a view.

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53 We therefore do not agree with the view of some submitters that the correct starting point for the Commission is to consider whether there is probative evidence to move away from the current 75th percentile. See New Zealand Airports Association "Further work on the cost of capital input methodologies: Response to invitation to provide evidence on the WACC percentile" (5 May 2014), paragraph 10; Orion New Zealand Limited "Submission on invitation to provide evidence on the WACC percentile" (1 May 2014), paragraph 27; Vector Limited "Further work on the cost of capital input methodologies: Submission to Commerce Commission on process update and invitation to provide evidence on the WACC percentile" (5 May 2014), paragraphs 41-44.

54 Though some of the evidence we have, such as the RAB multiples analysis, necessarily starts from the 75th percentile, because that evidence reflects the market response to having set the percentile at that level.

55 Beyond this threshold, and given that we are re-asking the fundamental questions relating to the WACC percentile, we do not agree that there is any further necessity for the Commission to have "compelling evidence demonstrating that the existing IM is flawed" or "strictly inferior", or to "apply a high burden of proof", before selecting a WACC percentile other than the 75th. See New Zealand Airports Association "Further work on the cost of capital input methodologies: Response to invitation to provide evidence on the WACC percentile" (5 May 2014), paragraph 26; PricewaterhouseCoopers "Submission to the Commerce Commission on Further work on the cost of capital input methodologies" (submission prepared for 21 EDBs, 5 May 2014), paragraphs 42 - 45; Transpower New Zealand Ltd "Further work on the cost of capital input methodologies: Request for further evidence" (1 May 2014), section 7.2; Orion New Zealand Limited "Submission on invitation to provide evidence on the WACC percentile" (1 May 2014), paragraph 27; Auckland International Airport "Re: Evidence regarding the appropriate weighted average cost of capital percentile that should be used under the cost of capital IMs" (5 May 2014), paragraph 10.

The role of purpose statements in the Commission's decision making

The input methodologies purpose statement

2.8 In considering an amendment to the WACC percentile, the Commission has been conscious of the purpose statement for IMs, and its emphasis on certainty. A number of earlier submissions from suppliers raised concerns that the proposed amendment process would undermine regulatory certainty in the Part 4 regime.[56]

2.9 We understand these submissions, and agree in principle that, in the normal course of events, regular changes to significant 'fixed' IM parameters are not desirable. But the current scenario is not 'normal':

2.9.1 the observations of the High Court mean that reconsidering the WACC percentile was inevitable - it is just a question of timing;

2.9.2 we considered the timing question, including seeking submissions from all interested parties, in February/March this year, and are not aware of any new, relevant information on this point that suggests we should revisit that decision;

2.9.3 we will consider submissions on our draft decision with an open mind, and are open to reaching a different view on the WACC percentile if compelling evidence is provided in submissions. Given the Court's fundamental criticism about lack of evidence, we would only, however, leave the percentile at the 75th if the evidence supported that.

The Part 4 purpose statement

2.10 The High Court emphasised the tension between the regulatory objectives in sections 52A(1)(a) and (d) in setting the WACC percentile ie, providing incentives to invest (and innovate) may drive you in a different direction than limiting excessive profits.[57]

2.11 We agree that the investment and profitability limbs of section 52A are particularly relevant when setting the WACC percentile, and must be balanced. The High Court understandably queried the basis upon which we were compromising the interests of consumers in lower prices. But, as emphasised in supplier submissions, we are also very aware of the longer-term benefit to consumers of incentivising the continued supply of reliable, efficient infrastructure services, as well as innovations in the supply of those services.

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56 See for example: Powerco Limited "RE: Invitation to have your say on whether the Commerce Commission should review or amend the cost of capital methodologies" (13 March 2014), page 1.

57 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraphs 1460 - 1461.

2.12 We also agree with the High Court's view that a loss analysis approach, which seeks to quantitatively determine the cost to consumers of a higher or lower percentile, is theoretically a valuable tool in better determining the right balance. Our concern about loss analysis has always been simply about whether it would provide reliable evidence.

2.13 We have therefore focused our further work on testing the extent to which a loss analysis can give us a robust basis for a WACC percentile decision, and on comparing this to other expert analysis and factual evidence before us. Given the Court's criticism, we consider that this was a more appropriate way to determine the WACC percentile than engaging in further theoretical debate about whether the previous Commission approach of allowing an uplift to the 75th percentile is correct in principle.[58]

The framework for loss analysis - consumer welfare versus total welfare standard

2.14 The outcome of a loss analysis will differ depending on whether a total welfare or consumer welfare standard is used:

2.14.1 a total welfare standard is consistent with an objective of maximising economic efficiency, where transfers of wealth between market participants are ignored;

2.14.2 a consumer welfare standard is consistent with maximising benefits to consumers from both an efficiency and distributional standpoint. In particular, any financial benefit consumers might receive due to wealth transfers associated with lower prices will be taken into account.

2.15 Some submitters have stated that we should only use a total welfare standard when undertaking any loss analysis ie, take no account of wealth transfers from suppliers to consumers.[59] Other submitters have argued that section 52A requires a consumer welfare standard.[60]

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58 The Court's tentative, in principle observations regarding how incentives to invest for suppliers are best promoted are not uncontroversial. See for example Dr Martin Lally "The Appropriate Percentile for the WACC Estimate" (19 June 2014), pages 17 - 20; Transpower New Zealand Ltd "Further work on the cost of capital input methodologies: Request for further evidence" (1 May 2014), section 4.

59 For example: Incenta Economic Consulting "Rationale for setting the regulatory WACC above the midpoint value" (report prepared for Electricity Networks Association, May 2014), page 12.

60 For example: Covec "Estimating WACC for Airports in New Zealand" (report prepared for Board of Airline Representatives New Zealand Inc, 30 April 2014), page 2.

2.16 We consider that benefits to consumers from wealth transfers due to lower prices are relevant to our analysis. While the weight placed on wealth transfers may be open to argument, we do not accept that the Part 4 framework suggests that they should not be taken into account at all. Our view is consistent with:

2.16.1 the High Court's analysis of the Part 4 purpose statement in the merits appeal judgment;[61]

2.16.2 the relevant Parliamentary materials prior to the Commerce Amendment Bill being passed;[62] and

2.16.3 the mandatory analysis required before recommending that any additional services be regulated under Part 4.[63] It is not logical in our view for the standard for imposing regulation on suppliers to be more concerned with wealth transfers between consumers and suppliers than the regulatory controls that are actually imposed.

2.17 Our analysis, and that of our experts, therefore adopts both consumer welfare and total welfare approaches. This means that in reaching our draft decision as to what will best promote the long term benefit of consumers by promoting outcomes consistent with outcomes produced in competitive markets, we have had regard to transfers from suppliers to consumers, but have also had regard to aggregate efficiency considerations.

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61 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013], paragraphs 660 - 666.

62 See for example the discussion about the various options for the Part 4 purpose statement in the Explanatory Note to the Commerce Amendment Bill 2008, pages 17 and 19-20.

63 See Commerce Act 1986, s52I(3), where the Commission must not only quantify material effects on allocative, productive and dynamic efficiency, but material distributional and welfare effects as well.

3. What is the problem the WACC percentile is intended to address?

3.1 This section introduces:

3.1.1 the potential costs and risks associated with setting the WACC too high or too low;

3.1.2 the loss function analysis supported by the Court for assessing the relative costs of under and over-estimating WACC; and

3.1.3 wider incentives operating under price-cap regulation that may affect our decision regarding the WACC percentile.

There are risks associated with setting WACC too high or too low

3.2 As WACC cannot be observed, it must be estimated. This raises the risk of estimation error: our estimate of WACC could be too high or too low relative to the true (but unobservable) WACC.

3.3 The consequences of setting WACC too high are different from the consequences of setting WACC too low.

3.4 If the allowed WACC is too high, the prices paid by consumers will be too high. As a result:

3.4.1 suppliers are likely to earn above-normal returns. Due to the high returns they can earn on their investment, suppliers may also invest more than consumers would like;

3.4.2 as consumers pay for the investment suppliers make, higher investment leads to higher prices. While there may be some benefit to consumers from this greater investment, the cost to consumers of this investment may be greater than the benefits; and

3.4.3 therefore, consumers suffer a loss if the WACC is too high.

3.5 Consumers will also suffer loss if the allowed WACC is too low.

3.5.1 If the WACC is too low, suppliers may struggle to attract capital and may invest less.

3.5.2 Over time, any such under-investment is likely to result in declines in the quality of service provided to consumers (subject to constraints imposed by quality standards), which may not be compensated for by the reduction in prices due to the lower RAB. The reduction in quality could take many forms including more frequent supply outages, longer outages (perhaps due to lower levels of network redundancy) and higher maintenance costs (which leads to further spending and eventually higher prices).

3.5.3 With the lower available returns on investment, suppliers may also be less likely to innovate through investment, and the development and introduction of new services and/or technologies may be deferred.

3.5.4 Under-investment may mean that opportunities are missed to reduce transmission grid congestion and enhance competition in generation.

3.5.5 On the other hand, lower returns on capital may spur suppliers to innovate and manage their networks in ways which require less capital investment. This could benefit consumers, but it could also lead to the inefficient substitution of operating costs for capital investment.

3.5.6 Overall, consumers suffer a loss if under-estimation of WACC results in suppliers' under-investing when the benefit of the investment foregone would exceed its cost.

Why we consider increasing the WACC for asymmetric losses

3.6 Given the potentially significant losses to consumers if our WACC estimate is wrong, we have considered the relative consequences of setting the WACC too high or too low.[64] In particular, we have considered:

3.6.1 how the expected losses from over-estimating WACC compare to the expected losses from under-estimating WACC; and

3.6.2 whether the expected losses are broadly symmetric so they offset each other (on an ex ante basis), or whether they are different (asymmetric).

3.7 If the expected losses from the WACC being wrong are symmetric, then we should choose the mid-point estimate of WACC. Doing so will minimise the expected losses to consumers.

3.8 However, if the expected losses are asymmetric, we should choose a WACC percentile that reflects the asymmetry in the respective losses of over- or under-estimating WACC.

3.9 For example, if under-estimating WACC leads to greater losses than over-estimating it, we should increase the WACC estimate we use. Doing so will reduce the likelihood of under-estimating the true WACC, and reduce the likelihood of incurring the social costs of under-investment.

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64 In addition to asymmetric losses from mis-estimating WACC, there can be asymmetric consequences from natural disasters. Such losses are discussed briefly in paragraphs 4.16 to 4.18 below, and in more detail in our decision on a customised price-quality path for Orion. See Commerce Commission, "Setting the customised price-quality path for Orion New Zealand Limited Final reasons paper – [2013] NZCC 21", (29 November 2013), Attachments B and C.

3.10 Ideally, if there are asymmetric losses, we would like to adjust the WACC to ensure that the losses expected at the margin from under-estimating WACC (given the probability of the WACC being under-estimated) are equal to the losses expected at the margin from over-estimating WACC (given the probability of WACC being over-estimated).

We have examined a loss function approach, as suggested by the Court

3.11 By estimating the social harm from over- and under-estimating WACC, we can seek to determine the WACC percentile that minimises the expected harm.

3.12 However, undertaking this loss analysis is not straightforward. This is because the relationship between WACC and the losses from getting WACC wrong is not well understood (at least as regards the quantification which is required to determine the optimal percentile).

3.12.1 To undertake robust loss analysis, we need to know and quantify all the potential losses to consumers if the WACC is wrong, and then set the WACC which (in combination with other aspects of the overall regime) minimises the expected harm.

3.12.2 In our 2009 draft cost of capital guidelines we commented that the loss analysis is "too mechanical and suggests a misplaced sense of precision and mathematical rigour".[65] Therefore, we did not undertake a quantified loss analysis at that time.

3.13 However, the High Court indicated we should consider loss analysis when we review the choice of WACC percentile under the IMs.[66] We understand these comments to advocate that the decision on the percentile would benefit from a fuller exploration of empirical evidence than was undertaken in setting the IMs.

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65 Commerce Commission, "Revised Draft Guidelines: The Commerce Commission's Approach to Estimating the Cost of Capital", (19 June 2009), paragraph 242.

66 Wellington International Airport Ltd & Ors v Commerce Commission [2013] NZHC [11 December 2013], paragraphs 1486-1487.

3.14 Therefore, in reaching our judgement on the appropriate WACC we have explored quantification of the loss analysis framework supported by the Court, discussed in submissions, and developed by our expert advisors (particularly Oxera and Dr Lally).

3.14.1 Oxera and Dr Lally have each built on the loss analysis model used by Professor Dobbs. Professor Dobbs' paper is based on theoretical analysis of the choice of WACC percentile, and has been described as "the best available analysis on this matter".[67] While limitations and criticisms of Professor Dobbs' analysis have been put forward since its publication, Dr Lally's paper has sought to address these.[68]

3.14.2 Variants of the loss analysis approach were presented in a number of the submissions made on our process paper, and our experts have had regard to these in developing their own approaches.

3.15 The loss function approach considers the cost of under-estimating WACC (eg under-investment which results in lower reliability, and/or deadweight loss from under-pricing) against the cost of over-estimating WACC (eg, over-investment, deadweight loss from over pricing, and possibly transfers).

3.16 However, due to difficulties in estimating the relative costs of under and over-estimating WACC, loss analysis can only be used to define an appropriate range of WACC percentiles (rather than a specific percentile). NERA (for NZ Airports) stated:[69]

> The perceived rigour of undertaking an empirical evaluation of the optimal percentile should not detract from the fact that any such analysis will remain heavily reliant on a range of estimates and assumptions. Any resultant estimate will be only as meaningful as the information and assumptions underpinning it. The output of such an exercise is therefore likely to be a range for the 'optimal' percentile rather than a definitive point.

How a WACC margin affects incentives under price-cap regulation

3.17 In deciding whether an uplift to the mid-point WACC is required, we have also considered other broader aspects of the overall regime and the extent to which these create and affect suppliers' incentives to invest and manage costs.[70]

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67 Dr Martin Lally, "The Appropriate Percentile for the WACC Estimate", (19 June 2014), page 2.

68 The criticisms and limitations are discussed in paragraphs 5.13 and 5.14 of this paper.

69 NERA Economic Consulting "Review of the WACC Percentile: A Report for the New Zealand Airports Association" (report prepared for New Zealand Airports Association, 5 May 2014), page v. And see page 31 in that report for further discussion. Incenta (for ENA) makes a similar point: "attempting to undertake a robust cost-benefit analysis of how marginal changes in the regulatory WACC will affect outcomes is a very difficult exercise, and one that is most likely impossible" Incenta Economic Consulting "Rationale for setting the regulatory WACC above the midpoint value" (report prepared for Electricity Networks Association, May 2014), page 1.

3.18 CPI-X regimes involve an inherent conflict between providing incentives for investment in network assets and incentives for cost reduction.

3.19 This conflict is played out between the short-term and long-term incentives that act upon suppliers. In the New Zealand context these incentives operate in a low cost default price-quality path regime with the business-exercised option of a customised price-quality path for EDBs and gas pipeline businesses, or in an individual price-quality path setting for Transpower.

3.20 The overall regulatory framework involves multiple potential incentives that operate at different levels of the businesses. The framework also seeks to balance difficult trade-offs between quality, network investment and price.

3.21 Under price-cap regulation, incentives to under-invest always arise during a regulatory period (once revenues have been set).[71] However, these incentives are mitigated by:

3.21.1 investors having a longer-term focus;

3.21.2 quality standards, and the consequent penalties for breaching these;

3.21.3 the need for a regulated business to credibly argue for an investment allowance at the beginning of the next regulatory period; and

3.21.4 other factors outside the Part 4 regulatory regime (including, for example, mandated safety standards and the potential for reputational harm to directors if "the lights go out").[72]

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70 A fuller discussion of the broader regime was set out in a discussion paper issued in June 2014. Commerce Commission, "Regulatory Incentives and the Cost of Capital: Working Paper", (23 June 2014). Available at http://comcom.govt.nz/regulated-industries/input-methodologies-2/further-work-on-wacc/.

71 However, it does not follow that under-investment will necessarily result. In Australia the main concern has been that the industry has over-invested. See, for example: AER, "Economic regulation of transmission and distribution network service providers AER's proposed changes to the National Electricity Rules", (September 2011) and Australian Productivity Commission, "Electricity Network Regulatory Frameworks", (April 2013).

72 These are discussed in more detail in Commerce Commission, "Regulatory Incentives and the Cost of Capital: Working Paper", (23 June 2014).

3.22 These incentives have implications for how a margin applied to WACC might affect investment incentives. In particular, for a margin to be effective, investors in a gas or electricity business must care about the long-term value of the business (their investment).[73] This longer-term focus can mitigate any incentive to run down the network for short-term gain provided by the price or revenue cap regulatory regime.

3.23 We develop quality standards when setting price-quality paths, and these can create incentives to invest. For a variety of reasons (including the asymmetry of information between the regulator and the supplier), these standards are difficult to specify.[74] As quality becomes better understood, for example through further information disclosure and summary and analysis, the incentives and controls on quality are likely to improve.[75]

3.24 The relative importance of each of these differing incentives will vary from supplier to supplier, for example reflecting the ownership structure of the firm and the differing investment needs of each network and its consumers. Opportunities to innovate can take a variety of forms, and can vary over time and between suppliers.[76] The relative importance of the incentives to invest and innovate for each supplier is therefore also likely to vary over time.

3.25 The incentives on suppliers from the uplift on WACC also vary during the regulatory cycle. This was noted by Oxera.[77]

3.25.1 *Prior to the price control period:* A business has an informational advantage over the regulator in developing its investment plan for the next regulatory period. If the WACC is set higher, this will strengthen the business' incentive to convince the regulator of the need to expand investment.

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73 Commerce Commission, "Regulatory Incentives and the Cost of Capital: Working Paper", (23 June 2014), paragraphs 9-14.

74 Commerce Commission, "Regulatory Incentives and the Cost of Capital: Working Paper", (23 June 2014), paragraph 42.47. We are proposing to put in place an incentive scheme that rewards over-performance on quality, and penalises underperformance.

75 Commerce Commission, "Regulatory Incentives and the Cost of Capital: Working Paper", (23 June 2014), paragraph 48-50.

76 Some examples of innovation were identified above at paragraph 3.5.3 to 3.5.5.

77 Oxera "Input Methodologies: Review of the '75th percentile' approach" (23 June 2014), page 13.

3.25.2 *During the regulatory period:* During the price control period, the business has incentives to under-invest. This incentive is a central feature and rationale for CPI-X regulation. This rationale is based on the expectation that the incentive is constrained by the quality standards the supplier must meet. While a higher WACC may mitigate this incentive, generally the WACC margin incentive is much weaker than the incentive to delay investment during the regulatory period. As well, unduly deferring investment may undermine the credibility of future investment requests which could lead to NPV-positive investment in the future, assuming WACC is set above the mid-point.

3.25.3 *At the end of the regulatory period:* The regulator may seek additional commitments to invest, if under-investment is observed. It may tighten quality requirements. It will take into account the actual investment undertaken relative to the business' previous forecast in resetting the price path.[78]

3.26 In summary, there are numerous factors influencing suppliers' overall incentives to invest. The relative significance of these incentives varies from supplier to supplier, and over time. There are potentially complex interactions between investment, capital expenditure incentives, quality incentives, innovation, and the uplift to WACC.

3.27 In our view, the uplift to WACC has a role in determining supplier's overall incentives to invest, but it is only one part of the mix. Other factors also create and influence suppliers' incentives to invest.

The relationship between a margin on WACC and the incremental rolling incentive scheme

3.28 The IMs include an incremental rolling incentive scheme (IRIS), which provides a mechanism by which suppliers are able to retain the benefits of efficiency gains beyond the end of a regulatory period.[79] The IRIS increases the incentives on suppliers to economise on capital expenditure and operating expenditure. We have proposed extending the IRIS to include capex.[80]

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78 We note a difference between actual and forecast investment could represent either more efficient investment or under-investment.

79 Electricity Distribution Services Input Methodologies Determination 2012 [2012] (NZCC 26); Gas Distribution Services Input Methodologies Determination 2012 [2012] (NZCC 27); and Gas Transmission Services Input Methodologies Determination 2012 [2012] (NZCC 28); and Transpower Input Methodologies Determination 2012 [2012] (NZCC 17).

80 Commerce Commission, "Proposed amendments to input methodologies: Incremental Rolling Incentive Scheme", (18 July 2014).

3.29 Some expenditure is discretionary and a supplier may reduce expenditure to achieve short-term profit targets. The ability to defer expenditure creates a buffer if returns are falling short of target, or the allowed WACC for that period is too low.[81] The IRIS strengthens the incentives to economise on expenditure by potentially allowing the supplier to keep savings beyond the next reset. Some of that reduction in expenditure may reflect genuine cost efficiencies.

3.30 The IRIS is justified because we have confidence that the owners and managers of regulated suppliers have long-term interests in maintaining quality. Those same interests assist in reducing the risk of under-investment when choosing the WACC percentile. It would be inconsistent to recognise those interests when extending the IRIS but not when considering the appropriate WACC percentile.

81 Even if the expected return is less than the WACC, investment may occur. Oxera suggests that underinvestment is not likely to occur unless there is a sustained shortfall of 0.5%-1.0% in WACC. Oxera, "Review of the '75th percentile' approach", (23 June 2014), page 69. We note that efficiency gains induced by the IRIS can offset a shortfall in WACC and reduce the risk of under-investment from too low a WACC.

4. Why we can make a decision on the WACC percentile now

4.1 This section explains:

4.1.1 why we have sufficient evidence to make a decision on the appropriate WACC percentile now;

4.1.2 our view that there are no significant interdependencies with other aspects of the cost of capital IMs (or the wider regulatory regime) which prevent us from amending the WACC percentile now; and

4.1.3 our approach to future reviews of the WACC percentile.

We have sufficient evidence to make a decision on the WACC percentile now

4.2 Since the IMs were originally set in 2010, we have gathered a significant amount of new evidence regarding the appropriate WACC percentile.

4.3 This new evidence and analysis is significantly more extensive than that previously available to us and the Court. The evidence includes relevant academic literature, independent expert reports we commissioned, further analysis of available data by us, and expert reports submitted by interested parties.[82] Therefore, we are now in a much better position to make an evidentially-robust decision regarding the appropriate WACC percentile.

4.4 Our independent experts, and interested parties' experts, have a range of views, and adopt analytical frameworks which differ on certain aspects. The lack of consensus among experts is unsurprising, because there are "known unknowns" that cannot be resolved with empirical or theoretical analysis (Oxera refers to this as "fundamental uncertainty" in its report). Further, as far as we are aware, no regulator has ever attempted to empirically estimate the 'optimal' WACC percentile before.

82 The available evidence is summarised in Chapter 5 of this paper from paragraph 5.7.

4.5 Although there are gaps in the available evidence, this is always going to be the case due to the fundamental uncertainty referred to above. For example, Professor Vogelsang notes there are some empirical relationships, which can be crucial to the analysis, but which we know very little about. For example:

4.5.1 little is known about the relationship between under-estimating the WACC and the resulting change in investment;

4.5.2 little is known about the relationship between under-investment and any change in reliability;[83] and

4.5.3 there is some knowledge about how a change in reliability may change welfare (the social costs of outages) but quantification is subject to significant error margins.

4.6 Similar uncertainties arise in assessing the effect of under-estimating WACC on possible changes to welfare resulting from factors such as innovation and increased competition.

4.7 Some submissions argued that the timeframes we have set for reconsidering the WACC percentile, including in particular completing a loss analysis, are too short.[84] We disagree. We have more information now, from a range of experts and viewpoints, and we will consider submissions and additional expert reports before we make a final decision. Interested parties have been aware since late March 2014 that we were further considering the choice of WACC percentile and our expert reports were released in late June 2014 to give submitters an additional four weeks to consider these before our draft decision was released.

4.8 In any event, further work cannot resolve all aspects of the fundamental uncertainty regarding the key empirical relationships referred to by Professor Vogelsang. Although the amount of information will increase and improve over time, fundamental uncertainty will remain.

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83 We agree with Professor Vogelsang (2014) that further information and analysis has the potential to better examine the empirical relationship between underinvestment and reliability. Professor Ingo Vogelsang, "Review of Oxera's Report, Input methodologies - Review of the '75th percentile' approach", (10 July 2014), page 7. Suppliers are likely to be in the best position to provide such evidence, and we welcome submissions to this purpose.

84 See, for example, NERA Economic Consulting "Expert Report on Cost of Capital Input Methodologies" (report prepared for Powerco Limited, 1 May 2014), pp.25-33.

4.9 Therefore, we must ultimately exercise judgement when selecting the WACC percentile. This is always going to be the case and is acknowledged in submissions. For example Incenta (for the ENA) observe that:[85]

> given the difficulty of quantifying the link between the regulatory WACC and investment levels, it would most probably be an impossible exercise to attempt to derive a scientific answer to the question of the extent to which the regulatory WACC should be set above the mid-point level, and should instead be a matter where the Commission exercises judgement.

4.10 In our view, the available evidence is sufficient to proceed with making a decision on the appropriate WACC percentile. This is because:

4.10.1 much more information to choose a percentile is available now, compared to when we determined the 75th percentile in 2010;

4.10.2 given the Court's questioning of the future use of the 75th percentile, it is appropriate to reconsider the appropriate percentile now (especially because the price-quality paths for EDBs and Transpower are being reset later this year); and

4.10.3 the evidence now available is sufficient in our view to confidently define a range, and to inform our exercise of judgement within that range; and

4.10.4 based on the evidence we have seen to date, the benefit of substantial extra work now in terms of further narrowing the range is likely to be low, in our view, and would not remove the need for us to ultimately exercise our judgement.

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85 Incenta Economic Consulting "Rationale for setting the regulatory WACC above the midpoint value" (report prepared for Electricity Networks Association, May 2014), page 4. See also NERA Economic Consulting "Review of the WACC Percentile: A Report for the New Zealand Airports Association" (report prepared for New Zealand Airports Association, 5 May 2014), pages 31-32. Auckland UniServices Ltd "Comment on "Further work on the Cost of Capital Input Methodologies. Commerce Commission invitation to provide evidence on the WACC percentile"" (report prepared for New Zealand Airports Association, 1 May 2014), pp.4-5, 12. Frontier Economics Pty Ltd "Evidence on the WACC percentile: A Report prepared for Transpower in response to the Commerce Commission consultation" (report prepared for Transpower New Zealand Ltd, May 2014), page 18.

4.11 The additional information available now, compared to the 2010 IMs determination includes:[86]

4.11.1 an empirical loss analysis focused specifically on the social costs of under- and over-estimating WACC for the New Zealand electricity lines industry;

4.11.2 evidence on the levels of investment by suppliers of electricity lines and gas pipeline services when subject to a WACC including the 75th percentile uplift; and

4.11.3 information on the prices paid by investors for shares in suppliers of regulated services, relative to the RAB for those businesses.

Why can we make a decision on the appropriate WACC percentile only

4.12 We have made a draft decision on the appropriate WACC percentile separately from a review of other aspects of the cost of capital IMs. We can do so as we consider:

4.12.1 the choice of percentile is not significantly interdependent with other aspects of the IMs;

4.12.2 the mid-point estimate of WACC is not biased; and

4.12.3 that catastrophic events and other asymmetric risks are best addressed through cash flows rather than an uplift to the mid-point estimate of WACC.

There are no interdependencies which prevent amending the WACC percentile now

4.13 Some submissions argued that we should not amend the WACC percentile now due to interdependencies with other aspects of the regulatory regime. We are not persuaded by these arguments.

4.13.1 In the 2010 IMs, the percentile was the last decision that was made regarding WACC, after having reached a view on all other parameters. The value for those other parameters was not a function of our choice of the 75th percentile estimate for DPP and CPP regulation.[87]

4.13.2 The rationale for an uplift to the WACC has not changed, but we have more evidence to determine the appropriate size of the uplift.

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86 The additional information now available is discussed further in chapter 5 from paragraph 5.7.

87 To the extent that parties want to further submit on these other parameters the IM review under section 52Y is the appropriate place to do so.

4.13.3 We do not accept that there is such a direct link between the 75th percentile and the other parameters of the IMs that the percentile cannot be amended at this time. In particular, we do not accept that we need to alter our allowance for the cost of debt, for example, the notional credit rating, if we amend our choice of WACC percentile.[88]

4.13.3.1 Uncertainty over the true level of the WACC stems primarily from uncertainty over the cost of equity, rather than over the cost of debt.[89]

4.13.3.2 The uplift to WACC is to encourage equity investment.

4.13.3.3 The uplift to the 75th percentile estimate was not introduced to ensure financeabilty of debt at the BBB+ credit rating assumed in the IMs.

No bias in mid-point estimate

4.14 Several submissions argued that our mid-point WACC is biased downwards, and the 75th percentile is needed to help correct this.[90] However, we consider the mid-point is the best estimate.

4.14.1 Some submissions argue that the High Court mischaracterised our view by stating that the mid-point is right and free from bias. For example, Powerco submitted that we justified the 75th percentile given the risk of bias in the mid-point estimate.

4.14.2 While there is uncertainty around the true WACC, we do not agree that the mid-point is biased downwards. There is uncertainty as to whether the mid-point is biased or not. The evidence regarding the existence (and direction) of bias is hard to interpret and sometimes conflicting. Certainly, no bias has been clearly demonstrated.

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88 Competition Economists Group "Review of the use of the 75th percentile: A Report for Orion" (report prepared for Orion New Zealand Limited, May 2014), pp.17-18.

89 Of the three components of the standard error of the WACC, two (in respect of the asset beta and TAMRP) relate to the cost of equity, whereas the standard error of the debt premium relates to the cost of debt. The latter has an immaterial impact on the standard error of the WACC (removing it reduces the WACC by 0.01%).

90 CEG (for Wellington Electricity) submit, by reference to comparative data from other regulators, that we should not be considering removing the 75th percentile from the IM WACC without also revisiting the IM mid-point WACC. We respond to this submission in Attachment B: Reasonableness Tests.

4.14.3 If such a bias was demonstrated, we consider this bias should be addressed directly (so that an unbiased mid-point was determined for all regulatory instruments under Part 4), rather than indirectly through the choice of WACC percentile used in setting price-quality paths.

4.15 Some parties refer to a reference in our IMs reasons paper as suggesting the 75th percentile was selected to respond to the potential for model error, specifically in relation to low beta stocks.[91] We note that the next bullet point in the IMs reasons paper refers to another potential model error, whether the version of the CAPM we use is appropriate for estimating the cost of equity for international investors. These two factors go in opposite directions, and neither was influential in choosing the 75th percentile over some other percentile, such as the mid-point. Rather, the IM reasons paper states that the reasons for selecting the 75th percentile for setting price-quality paths reflected:[92]

4.15.1 that the costs from the point of view of consumers associated with under-estimation of the cost of capital in the Part 4 regulatory setting, are likely to outweigh the short-term costs of over-estimation;

4.15.2 the Part 4 Purpose (the long-term benefit of consumers);

4.15.3 the uncertainty in estimating the true cost of capital; and

4.15.4 that in workably competitive markets not all risks can be passed on to the consumer in the form of higher prices.

Catastrophic events and other asymmetric risks are best dealt with in cash flows, not WACC

4.16 Submissions also argued that we should select a higher percentile to cater for catastrophic and other risks.[93] They have noted that our Orion CPP decision referred to the practical effect of using the 75th percentile as providing a buffer for catastrophic events. We consider that our observations in the Orion paper are correct. We do not agree that they require continued use of the 75th percentile as a minimum uplift to WACC. Nor do we agree that we need to make an additional allowance for bearing asymmetric cash-flow risks from catastrophic events.[94]

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91 Commerce Commission, "Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper", (December 2010), Para 11.54, fourth bullet point.

92 Commerce Commission, "Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper", (December 2010), paragraph 11.62, 11.65.

93 Competition Economists Group “Review of the use of the 75th percentile: A Report for Orion” (report prepared for Orion New Zealand Limited, May 2014), pp.17-18.

94 Which Orion proposes, referring to a report commissioned from CEG. See Orion New Zealand Limited “Submission on invitation to provide evidence on the WACC percentile” (1 May 2014), paragraph 8-17.

4.17 It is our view that catastrophic events and other asymmetric risks are best dealt with through cash flows, (eg, by resetting price paths), rather than as an addition to WACC. In the case of Orion:[95]

4.17.1 we allowed Orion to recover the prudent opex and capex costs that it incurred from the time of the earthquakes until the price path was reset;

4.17.2 we allowed Orion to recover un-recovered transmission costs (for the same period);[96]

4.17.3 the reset path for 2014-2019 reflected allowance for further prudent opex and capex;[97]

4.17.4 Orion continued to earn a return on and of capital on assets that are damaged beyond repair (but which are not disposed of).[98] (Further, assets that are stranded for other reasons (such as technological change) are also not removed from the RAB, but rather remain in the RAB and continue to earn a return on and of capital.[99] Suppliers can also apply to have depreciation recovered more quickly);[100] and

4.17.5 only some demand risk (from the time of the earthquakes until the price-quality path was reset) was borne by Orion.[101]

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95 Commerce Commission, Setting the customised price-quality path for Orion New Zealand Limited Final reasons paper – [2013] NZCC 21, paragraphs B59-B70.

96 Commerce Commission "Setting the customised price-quality path for Orion New Zealand Limited" [2013] NZCC 21 (29 November 2013), paragraph B136-B140.

97 We propose to allow EDBs to recover prudent opex and capex from the time of a catastrophic event path until the path is reset. This can be done through: the DPP re-opener provision that the High Court required; the proposed recoverable cost provision we are consulting on; or through the reset of the DPP via a catastrophic event CPP. For further discussion, see: Commerce Commission, "Proposed Default Price-Quality Paths For Electricity Distributors From 1 April 2015" (4 July 2014), chapter 8, pp49-53. How Transpower's price-quality path would change if there was a catastrophic event is discussed in: Commerce Commission, "Setting Transpower's individual price-quality path for 2015—2020", (16 May 2014), in Attachment D, pp.109-111.

98 Commerce Commission, Setting the customised price-quality path for Orion New Zealand Limited Final reasons paper – [2013] NZCC 21, paragraph B56.2.

99 A number of submissions and expert reports do not acknowledge this feature of the Part 4 regime. See, for example, NERA Economic Consulting "Expert Report on Cost of Capital Input Methodologies" (report prepared for Powerco Limited, 1 May 2014), page 17-18. The treatment of stranded assets under the IMs is discussed in: Commerce Commission, "Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons paper", (December 2010), at paragraphs E11.1 to E11.16.

100 This is done through an application for a CPP with non-standard depreciation. Non-standard depreciation is discussed in the IM Reasons Paper at paragraphs E10.61 to E10.71.

101 Transpower and GTBs are subject to a revenue cap and therefore are exposed to little or no demand risk. These businesses therefore face little residual catastrophic risk.

4.18 In respect of the residual demand risk that Orion was not able to recover, our decision on Orion's customised price-quality path:

4.18.1 explained how the impact of the Canterbury earthquakes would have only a minor impact on a diversified investor, and that such an investor would require minimal or no compensation for bearing such risks.[102] It was in this context that we noted that the practical effect of using the 75th percentile WACC was to provide a buffer against the financial impact of catastrophic events;[103]

4.18.2 explained that consumers should not bear all the risks and costs associated with catastrophic events as investors are better able to diversify their investments and manage demand risk from such events than consumers;[104] and

4.18.3 noted that the expected cost of catastrophic events is expected to have a relatively minor impact when compared to the observed cost of capital.[105]

4.19 Transpower refers to what it submits are inconsistent statements by us on whether the 75th percentile addresses asymmetric risk.[106] In our view the quotes are not inconsistent, as they are referring to two different scenarios.

4.19.1 The first quote, from the IM reasons paper, states that the IM makes no allowance for Type I asymmetric risk (eg, natural disasters).

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102 Commerce Commission, Setting the customised price-quality path for Orion New Zealand Limited Final reasons paper – [2013] NZCC 21, paragraphs B73-B97.

103 Commerce Commission, Setting the customised price-quality path for Orion New Zealand Limited Final reasons paper – [2013] NZCC 21, paragraph C5.2.

104 Commerce Commission, Setting the customised price-quality path for Orion New Zealand Limited Final reasons paper – [2013] NZCC 21, from paragraph B20. Suppliers subject to revenue caps are exposed to little or no demand risk.

105 Commerce Commission, Setting the customised price-quality path for Orion New Zealand Limited Final reasons paper – [2013] NZCC 21, paragraph C31.

106 Transpower New Zealand Ltd "Further work on the cost of capital input methodologies: Request for further evidence" (1 May 2014), page 12, table 2.

4.19.2 The second quote (which Transpower states is from the Orion CPP decision, but is in fact from a draft DPP reset paper[107]) is discussing the asymmetric social costs of getting the estimate of WACC wrong. This is plain when considering its context: namely which discount rate should be used to estimate clawback. Since the over- and under-recovery referred to something that had already occurred, the choice of discount rate was unlikely to affect incentives.[108]

Alternative approaches to addressing asymmetric losses from under-investment

4.20 There are a range of regulatory tools for addressing the risks associated with setting WACC too high or too low. For example:

4.20.1 a requirement to supply reduces the asymmetric risk of under-investment, without the need to increase WACC;

4.20.2 quality standards, with penalties, also reduce the risk of under-investment. The changes to the Consumer Guarantees Act will similarly provide businesses with incentives to deliver quality (and invest to do so); and

4.20.3 suppliers' ability to ask for consumer contributions also provides some protection against under-investment.

4.21 Using these tools, especially changing regulated quality standards, may be a better way to mitigate the risks of under-investment than a WACC uplift (or a partial substitute to such an uplift). This is because, as Professor Vogelsang notes, the cost to consumers of the uplift to WACC is considerable and may not be worthwhile relative to the size of the incremental investment that results.[109] We provide an approach to considering these costs and benefits in Attachment C.

Approach to future reviews of the WACC percentile

4.22 A full review of the cost of capital IMs is required to be completed by December 2017. This will cover all aspects of the cost of capital IMs, including:

4.22.1 all the parameters and their values;

4.22.2 estimation of the standard error of the WACC (which we use to generate the WACC distribution); and

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107 Commerce Commission, "Revised Draft Reset of the 2010-15 Default Price-Quality Paths", (21 August 2012), paragraph L34.

108 Commerce Commission, "Revised Draft Reset of the 2010-15 Default Price-Quality Paths", (21 August 2012), paragraph L34.

109 Professor Ingo Vogelsang “On the economic effects of allowing a WACC above the midpoint” (12 June 2014), paragraph 19.

4.22.3 the choice of percentile used in setting price-quality paths.

4.23 During that review we will reconsider any significant new information relevant to the WACC percentile, to see whether change is warranted. This is the same approach as we would take for all aspects of the IMs and could lead to the IMs producing higher or lower WACC estimates. We note that:

4.23.1 providing regulated services requires investment in assets with long lives;

4.23.2 the stability and predictability of the WACC supports the incentives to invest in the supply of regulated services; and

4.23.3 that large and/or frequent changes in the uplift (or other aspects of the IM) could affect this incentive.

4.24 On the other hand, regulators overseas typically revisit their WACC estimates as part of each price path reset. Their estimates for key parameters, and the overall WACC, can therefore change from period to period to reflect changes in market conditions.[110]

4.25 We acknowledge the submissions to the effect that we should only consider amending the WACC percentile as part of an IM review. We explained our reasons for undertaking this review now in paragraphs 4.2 to 4.11. In respect of possible future IM amendments being made outside of a statutory review, we will give further consideration as to the circumstances when we would or would not consider making such amendments and anticipate we will formally seek the views of interested parties on this in due course.

We will consider the split cost of capital in the wider review of the IMs

4.26 The Court indicated that it expects us to consider the split cost of capital approach proposed by MEUG when reviewing the IMs.

4.27 We intend to address the split cost of capital issue in the wider review of the IMs to be completed by the end of 2017.[111] If we were to implement a split cost of capital approach, we would also need to reconsider the appropriate WACC percentiles that would apply under the split cost of capital.

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110 We too have sought to respond to substantial changes in market conditions when necessary. In particular, in recognition of the effects of the Global Financial Crisis, we introduced a 0.5% temporary uplift to the tax-adjusted market risk premium.

111 We note that no respondents supported resolving the split cost of capital issue now. Therefore, our notice of intention was limited to the WACC percentile.

5. The case for using a WACC above the mid-point estimate

5.1 This section considers the case for using a WACC above the mid-point estimate, in light of:

5.1.1 comments made by the High Court in the IMs merits appeals judgment; and

5.1.2 the significant body of evidence we have gathered in response to the Court's judgment.

5.2 In our view, the available evidence supports using a WACC significantly above the mid-point estimate. This is because the potential costs to consumers of under-investment from a WACC that is too low are likely to outweigh the harm to customers (including any over-investment) arising from a WACC that is too high.

The Court was sceptical about using a WACC above the mid-point estimate

5.3 In the IMs merits appeals judgment, the High Court was sceptical regarding whether it is appropriate to use a WACC above the mid-point. The Court stated that it expects us to consider its "scepticism about using a WACC substantially higher than the mid-point" the next time the IMs are reviewed.[112]

5.4 Although the Court put forward some "tentative in-principle arguments" against our use of the 75th percentile WACC estimate, its strongest view was that we need to do further work on the WACC percentile. A more detailed summary of the Court's comments is contained in paragraphs 1.10 to 1.11 above.

5.5 When indicating that we should conduct further analysis regarding the WACC percentile, the Court referred to a decision from the Australian Competition Tribunal (regarding Telstra) which stated:[113]

> …there exists as a matter of theory the potential for asymmetrical consequences should the WACC be set too low or too high. Which of these consequences will carry with it the greatest social damage is not a matter solely for theory, however, but for robust empirical examination, well-guided by theory, of the actual facts of any particular case.

5.6 The Court concluded that "…further analysis and experience may support the Commission's original position. But they may not".[114]

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112 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [11 December 2013], paragraph 1486.

113 *Telstra Corporation Ltd (No 3)* [2007] ACompT 3 at [457].

114 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [11 December 2013], paragraph 1486.

We have gathered significantly more expert evidence following the Court's judgment

5.7 In response to the Court's judgment, we have gathered a substantial body of expert evidence regarding whether a WACC above the mid-point estimate should be used. This body of evidence includes:

5.7.1 relevant academic literature, notably a paper by Professor Ian Dobbs regarding welfare loss asymmetries arising from uncertainty in the regulatory WACC;

5.7.2 independent reports prepared by our expert advisors: Oxera, Professor Ingo Vogelsang, Professor Julian Franks, Dr Martin Lally, and Economic Insights; and

5.7.3 expert reports submitted on behalf of interested parties, in response to consultation papers we released.

Relevant academic literature regarding the WACC percentile

5.8 We asked Dr Martin Lally to conduct a review of relevant literature regarding the WACC percentile. When summarising his findings, Dr Lally refers to three main papers:[115]

5.8.1 Wright *et al* (2003) was the first paper to consider the implications of WACC uncertainty for the regulator's choice of a WACC value.[116] They note that the optimal regulatory WACC minimises the expected aggregate loss of economic surplus resulting from under- and over- estimating WACC, over the probability distribution for the true WACC. Wright *et al* note that this could lead to a regulatory WACC estimate above or below the point estimate, depending upon the elasticity of demand.

5.8.2 Dobbs (2011) extended the analysis conducted by Wright *et al* by considering both existing investment, and new investment that is deferrable or non-deferrable.[117] Unlike Wright *et al*, Dobbs also presents WACC values under various scenarios. Dobbs' findings and critiques of his approach are summarised in paragraphs 5.10 to 5.14 below.

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115 Dr Martin Lally "The appropriate percentile for the WACC estimate" (19 June 2014), pages 4-7.

116 Wright, S., Mason, R., and Miles, D., 2003. A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K., report prepared for the UK economic regulators.

117 Dobbs, I., 2011. Modelling Welfare Loss Asymmetries Arising from Uncertainty in the Regulatory Cost of Finance, *Journal of Regulatory Finance* 39, 1-28.

5.8.3 LECG (2007) took a different approach and argues that the choice of a percentile from the WACC distribution should be based upon a "loss function".[118] LECG shows that, under an asymmetric linear loss function, the 75th percentile WACC estimate is consistent with losses from under-estimation being three times greater than over-estimation.[119]

5.9 Dr Lally concludes that "[t]he best available analysis on this matter is provided by Dobbs (2011)".[120]

5.10 Dobbs considers the welfare consequences of the regulator allowing a high or low cost of capital. He uses Monte Carlo simulation to estimate the welfare-maximising WACC relative to the mean of the calculated range. His conclusions differ by investment category, and the base case percentiles are:

5.10.1 **Sunk investments:** 45th percentile;

5.10.2 **New non-deferrable investments:** 86th percentile; and

5.10.3 **New deferrable investments:** 97th percentile.

5.11 Dobbs also considers the case where a regulator applies the same WACC to both existing and potential new investment. In this situation, his base case estimate is the 74th percentile.

5.12 Expert reports submitted by interested parties generally agree that Dobbs provides a useful analytical framework for considering the WACC percentile.

5.12.1 NZIER (for MEUG) stated that "…the framework adopted in the Dobbs paper a useful starting point for examining analytical evidence regarding the appropriate WACC percentile".[121]

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118 LECG "Response on Behalf of Vector Ltd to the Commerce Commission's Estimate of WACC in the Draft Authorisation for the Control of Supply of Natural Gas Distribution Services by Powerco Ltd and Vector Ltd" (26 November 2007), section 4.

119 We note that Sapere has built on the LECG (2007) paper, in a submission for Vector as part of our current consultation process. Sapere discusses different forms of loss functions, including piece-wise linear and LINEX loss functions. Sapere Research Group "Setting the WACC percentile for Vector's price quality path" (report prepared for Vector Limited, 5 May 2014). (Sapere was previously known as LECG).

120 Dr Martin Lally "The appropriate percentile for the WACC estimate" (19 June 2014), page 2.

121 New Zealand Institute of Economic Research "Review of evidence in support of an appropriate WACC percentile: Response to Commission invitation of 31 March 2014" (report prepared for Major Electricity User's Group, May 2014), page 11.

5.12.2 Frontier Economics (for Transpower) stated "Dobbs (2011) has provided a clear framework not only for developing an allowed rate of return loss function for regulated suppliers, but also for utilising that function to estimate the optimal allowed rate of return percentile within a range…".[122]

5.12.3 Sapere (for Vector) stated "Dobbs' work provides analytical support for Commission's approach of adopting an increment to the estimated WACC range".

5.13 However, there are a number of significant limitations of Dobbs' analysis. For example, Dr Lally notes that the price elasticity range used by Dobbs is unsuitable for regulated services (other issues raised by Dr Lally are discussed in paragraph 5.34 below). Professor Vogelsang also notes that Dobbs' assumption that any WACC shortfall will make investment cease altogether appears unrealistic.[123]

5.14 Submissions also highlight limitations of Dobbs' approach, for example:[124]

5.14.1 Professor Sudarsanam (for Air New Zealand) notes that Dobbs' does not deal with over-investment by the regulated entity, inter-sectoral welfare losses and gains, the impact of regulated charges on user investments (and consequent welfare losses), and any empirical evidence (instead the paper relies on Monte Carlo simulation).[125]

5.14.2 Covec (for BARNZ) submitted that Dobbs' paper is not directly helpful because it treats firm profits as part of the welfare function to be maximised, but the Part 4 purpose is to promote the long-term benefit of *consumers*.[126] NZIER also queried Dobbs' inclusion of supplier profits in the welfare calculations.[127]

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122 Frontier Economics Pty Ltd "Evidence on the WACC percentile: A Report prepared for Transpower in response to the Commerce Commission consultation" (report prepared for Transpower New Zealand Ltd, May 2014), page vi.

123 Professor Ingo Vogelsang "Review of Oxera's Report, Input methodologies - Review of the '75th percentile' approach" (10 July 2014), page 8, paragraph 15.

124 Dr Lally has considered the criticisms of Dobbs' approach raised by Covec and NZIER. For example, Dr Lally disagreed with Covec's view that the Part 4 purpose statement means that producer surplus should be ignored. Dr Martin Lally "The appropriate percentile for the WACC estimate" (19 June 2014), pages 20-22.

125 Professor Puliyur (Sudi) Sudarsanam "An expert's report on the use of a 75th percentile from the WACC range for information disclosure requirements of airports in New Zealand for the purpose of profitability assessment by the Commerce Commission" (expert for Air New Zealand, 4 May 2014), paragraph 4.8.5.

126 Covec "Estimating WACC for Airports in New Zealand" (report prepared for Board of Airline Representatives New Zealand Inc, 30 April 2014), page 7.

127 New Zealand Institute of Economic Research "Review of evidence in support of an appropriate WACC percentile: Response to Commission invitation of 31 March 2014" (report prepared for Major Electricity User's Group, May 2014), page 14.

5.14.3 Like Dr Lally, NZIER (for MEUG) and Covec (for BARNZ) questioned the price elasticity of demand used by Dobbs.[128] Covec also discussed the implications of real options assumed in Dobbs' approach.[129]

Our independent expert reports

5.15 We have received several independent expert reports to assist us in reaching our draft decision on the appropriate WACC percentile. These reports were prepared by:

5.15.1 European economic consulting firm Oxera;

5.15.2 Professor Ingo Vogelsang of Boston University;

5.15.3 Professor Julian Franks of London Business School;

5.15.4 Dr Martin Lally of Victoria University (as introduced in paragraph 5.8 above); and

5.15.5 Australian economic consultancy firm Economic Insights.

5.16 The key findings of these reports are summarised below.

Oxera

5.17 Oxera develops a framework for identifying the appropriate WACC percentile, using available quantitative evidence. Oxera's general approach is to empirically estimate the expected losses to consumers from over- and under-estimating the true cost of capital for various percentiles of the WACC distribution.

5.18 Oxera's report is based on the loss function approach supported by the Court, and builds on the analysis conducted by Professor Dobbs by including an assessment of wider social and economic effects. The social loss function used by Oxera is illustrated in Figure 5.1 below.

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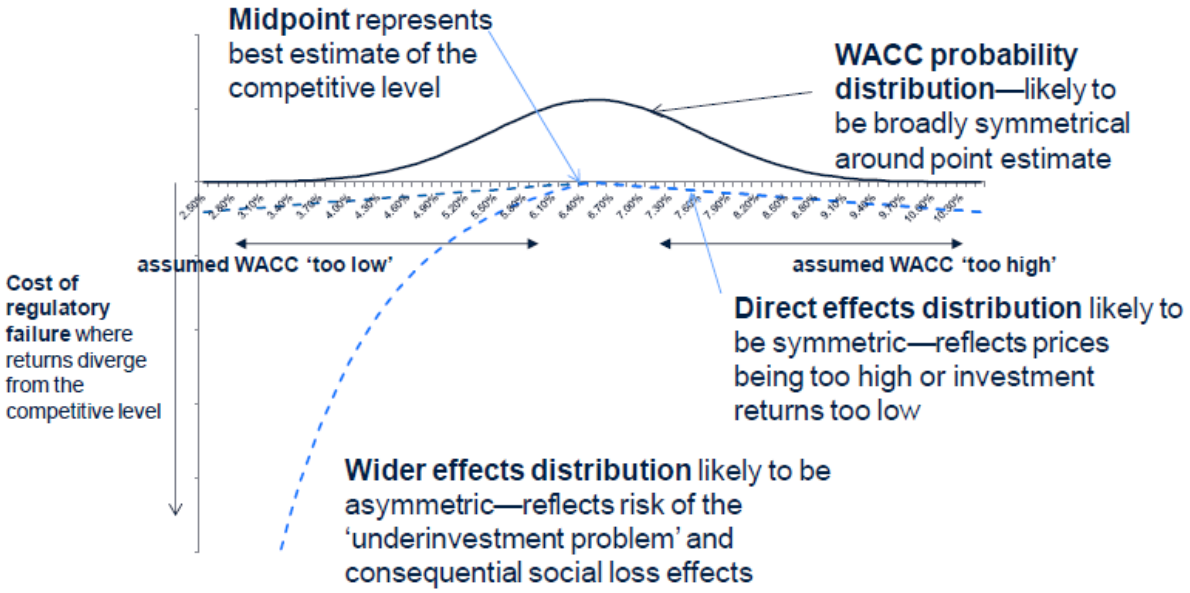
128 New Zealand Institute of Economic Research "Review of evidence in support of an appropriate WACC percentile: Response to Commission invitation of 31 March 2014" (report prepared for Major Electricity User's Group, May 2014), page 7.

129 Covec "Estimating WACC for Airports in New Zealand" (report prepared for Board of Airline Representatives New Zealand Inc, 30 April 2014), pages 8-10.

Figure 5.1: Illustration of Oxera's framework for the WACC percentile



Source: Oxera[130]

5.19 When describing the framework it has used, Oxera notes that a downside risk is likely to result from a shortfall between the actual and assumed WACC. Oxera explains that:[131]

5.19.1 this downside risk is likely to be skewed, and increase sharply as the gap between actual and assumed WACC grows (since this will quickly increase the incentive for the companies to under-invest);[132] and

5.19.2 in electricity, this risk is derived from the consequential effect that, over time, under-investment will lead to failures on the network, with potentially significant social and economic costs.

130 Oxera "Input methodologies: Review of the '75th percentile' approach" (23 June 2014), page 2.

131 Oxera "Input methodologies: Review of the '75th percentile' approach" (23 June 2014), page 3.

132 Consistent with Oxera's analysis, Sapere's discussion of loss functions supports the view that the loss is small for low over or under-estimation, but is exponential for significant under-estimation. Sapere Research Group "Setting the WACC percentile for Vector's price quality path" (report prepared for Vector Limited, 5 May 2014), pages 6 and 18-20.

5.20 Oxera utilised data from a range of sources to estimate the effects shown in Figure 5.1 above, and form recommendations regarding the appropriate WACC percentile.[133] Oxera's analysis is based on the probability of exceeding or falling short of the true WACC, for various possible WACC percentiles. In addition, Oxera considers the amounts by which the allowed WACC is likely to exceed or fall short of the true WACC.

5.21 On the basis of its analysis, Oxera concludes that a point estimate around the 60th to 70th percentile provides a suitable balance between the costs and benefits of mitigating the significant risks associated with under-investment. In reaching this conclusion, Oxera notes that:[134]

5.21.1 **The 50th percentile is likely to be too low.** At the 50th percentile, the incentives to invest will be relatively low as new investment adds no value to the business. The potential costs of under-investment are material. Evidence from actual events and analysis of potential events in other countries suggests that a severe outage event resulting from under-investment could result in a cost with an annualised economic value equivalent to over NZ$1bn. Some premium for customers to reduce these costs appears reasonable and proportionate.

5.21.2 **The 90th percentile is likely to be too high.** Even at the 80th percentile, the cost of protection appears relatively high compared with the level of benefits, given the wider measures put in place by the Commission.[135]

5.21.3 **The proposed form of economic impact analysis has limitations, but some of these relate to points of fundamental uncertainty, rather than points that can be readily addressed with further analysis.** It will be difficult to identify a probability that a particular value for the assumed WACC directly results in under-investment. However, it is instinctively consistent with the workings of financial markets and the competition for capital that a shortfall of 0.5–1% (or more) is likely to increase the risk of triggering a rebalancing of medium-term investment plans, and a move by investors towards deferring investment as far as possible.

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133 Oxera "Input methodologies: Review of the '75th percentile' approach" (23 June 2014), pages 3-4.

134 Oxera "Input methodologies: Review of the '75th percentile' approach" (23 June 2014), page 6.

135 For example, Oxera notes that the under-investment problem will be (or could be) in part mitigated by output and quality incentives (including incentive schemes such as IRIS) and asset stewardship requirements. Oxera "Input methodologies: Review of the '75th percentile' approach" (23 June 2014), pages 65-66.

5.21.4 **Any premium should be applied to all RAB assets and applied consistently**, as the expected whole-life return on assets should be the relevant test for investors. This also strongly points to the New Zealand approach of providing certainty over the need for a premium, rather than a case-by-case basis, as applied more generally by other regulators.

5.22 Professor Vogelsang conducted a peer-review of Oxera's report, concluding that it goes a significant way towards addressing the High Court's comments regarding the WACC percentile. He stated (emphasis added):[136]

> The Oxera Report may be the first serious empirical attempt towards providing a cost-benefit analysis of the policy of setting a regulated WACC above its expected measured value. In doing so Oxera goes a significant way towards fulfilling the High Court's aspirations for a NZCC decision on the optimal percentile of the WACC distribution. It provides for some sound empirical base for a decision.
> …
> The report is careful in describing the various steps involved in doing the empirical analysis and in highlighting the problems incurred. While the costs to consumers from higher prices associated with a higher WACC turn out to be conceptually straightforward and measurable, the costs to consumers from a WACC below the true cost of capital are complex and, according to Oxera, fraught with "fundamental" uncertainty, leaving an ultimate assessment to the regulator's judgement.
>
> Thus, while Oxera's analysis is likely to inform the regulator about the nature of the problem, it is only weakly suggestive of the outcome, which is for the NZCC to set an allowed WACC between the 60th and the 70th percentile of the WACC distribution. In my view, **the report's main insight is that only some of the relationships necessary for a sound decision can empirically be estimated and that for the remaining relationship the NZCC needs to its use judgement**.

5.23 However, Professor Vogelsang highlighted some limitations of Oxera's analysis, including:

5.23.1 Oxera's model lacks an explicit treatment of the effects of investments on the RAB. In particular, Oxera has not addressed the annual cost savings to consumers, due to reduced investment in the future, that would result if a WACC lower than the 75th percentile is used. Instead, Oxera only addresses static consumer welfare effects of price changes (from a change in WACC) for a given RAB value.[137]

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136 Professor Ingo Vogelsang "Review of Oxera's Report, Input methodologies - Review of the '75th percentile' approach" (10 July 2014), page 1, paragraphs 2-5.

137 Professor Ingo Vogelsang "Review of Oxera's Report, Input methodologies - Review of the '75th percentile' approach" (10 July 2014), page 7-8, paragraphs 14-18.

5.23.2 The analysis would be substantially enhanced by information on the probability of outages, which could be supplied by New Zealand electricity distribution businesses and Transpower.[138] International benchmarking could also assist in estimating outage probabilities and their effects.[139]

Professor Ingo Vogelsang

5.24 In his 12 June 2014 paper, Professor Vogelsang considers the economic effects associated with allowing a WACC above the mid-point. His conclusions are summarised below.[140]

5.24.1 Any attempt at empirical investigation of the effects of setting the allowed WACC at specific percentiles will produce highly uncertain results that may suggest more precision than attainable. This is because there are some empirical relationships which can be crucial, but which we know little about (for example, the relationship between under-estimation of WACC and the resulting change in investment, and the change in investment and resulting change in reliability).

5.24.2 If reliability investment is currently at the optimum level, the marginal cost of additional investment is just balanced by the marginal benefits of a reliability increase. This suggests that there will be no great net gain from additional investment, because the cost of investment (in terms of price increases for consumers) will be just as high as the benefits resulting from a reduction in the probability of outages. Therefore, any argument for using the WACC percentile as a major tool to increase investment has to be based either on a large investment effect, or on some inherent deviation of investment from the welfare optimum.[141]

5.24.3 Since market failures vary from industry to industry and from type of investment to type of investment, the allowed WACC should be differentiated on a case-by-case basis in order to correct for market failures.

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138 We invite submissions providing evidence on this point.

139 Professor Ingo Vogelsang "Review of Oxera's Report, Input methodologies - Review of the '75th percentile' approach" (10 July 2014), page 2.

140 Professor Ingo Vogelsang "On the economic effects of allowing a WACC above the midpoint" (12 June 2014), pages 10-11.

141 Professor Vogelsang notes that steep marginal benefit and/or steep marginal cost curves for investment may provide justification for allowing a WACC above the mid-point. This is because under steep marginal benefit and/or marginal cost curves, there is a significant welfare effect from reducing investment below the optimal level (relative to the case of flat marginal benefit and/or marginal cost curves). Professor Ingo Vogelsang "On the economic effects of allowing a WACC above the midpoint" (12 June 2014), pages 5-6.

5.24.4 If a common WACC percentile is chosen across industries and different forms of investment, this should be above the 50th percentile of the WACC distribution, but probably below the 75th percentile deemed correct for reliability investments in electricity distribution networks.

5.24.5 The case for allowing a WACC above the mid-point estimate may be much weaker than the conventional arguments state and may be restricted to specific types of investment (such as innovations, reliability, or particularly lumpy investments). However, a switch from consumer welfare to total surplus as the welfare criterion would strengthen the case for potentially going up to the 75th percentile, because of the resulting price effect on the whole output produced by the firm.

Professor Julian Franks

5.25 Professor Julian Franks has elaborated on the reasons for his previous recommendations regarding the WACC percentile. In 2008, Professor Franks, Dr Martin Lally and Professor Stewart Myers provided us with recommendations on the approach to estimating the cost of capital.[142]

5.26 In his 2008 recommendations, Professor Franks:[143]

5.26.1 agreed with the Commission's policy of setting the WACC equal to, or greater than, the mid-point of the estimated range, in recognition of the asymmetric costs of setting the WACC too low; and

5.26.2 recommended that the Commission evaluate how far above the mid-point of the range it moves on a case-by-case basis.

5.27 The Court noted that the 2008 recommendations from our expert advisors were expressed in very conclusionary terms, and the reasoning was not explained in any detail.[144] Therefore, we asked Professor Franks (and Dr Lally) to expand on his reasons.[145]

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142 Professor Franks, Dr Lally and Professor Myers "Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology" (18 December 2008).

143 Professor Franks, Dr Lally and Professor Myers "Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology" (18 December 2008), pages 36-37, recommendations 53 and 55.

144 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [11 December 2013], paragraph 1436.

145 Dr Lally's views are discussed in paragraphs 5.31 to 5.34 below. As discussed in footnote 36 above, we have not sought further explanation from Professor Myers at this stage.

5.28 Professor Franks has reiterated his support for a WACC above the mid-point, although he does not specify a particular range. He explains:[146]

> My view was that the under-investment problem was more costly to consumers than the over-investment problem. I felt this to be the case because regulated industries such as electricity, gas and telephony were so important that we could not afford to have 'the lights go out' or the equivalent. In that event we might wish to set a cost of capital above the mean WACC so as to reduce the possibility of under-investment.

5.29 Professor Franks notes that the size and cost of the under-investment problem will be affected by a number of factors, including those listed below.[147]

5.29.1 The length of the price control: a longer price control will increase the costs of under-investment.

5.29.2 Volatility: the more volatile the cost of capital, the greater the under-investment problem becomes (and vice versa). Since volatility changes over time, it follows that the cost of the under-investment problem also changes over time.

5.29.3 The level of investment: with higher future levels of investment, the greater the under- investment problem, and with lower levels of investment, the smaller the under-investment problem. The amount of discretionary investment will also affect the under-investment problem.

5.29.4 Competition: in telephony the level of innovation is high and assets may have shorter lives. Timely investment is important and the postponement or cancellation of investment may affect companies differentially, and therefore affect the competitive environment.

5.30 Professor Franks concludes that:[148]

5.30.1 these factors suggest there is good reason to set a WACC above the mean of the distribution; and

5.30.2 some of these factors affect industries differentially, so the amount of headroom set may vary across industries (and even change over time).

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146 Professor Julian Franks "Memorandum" (20 June 2014), page 1.

147 Professor Julian Franks "Memorandum" (20 June 2014), pages 1-2.

148 Professor Julian Franks "Memorandum" (20 June 2014), page 2.

Dr Martin Lally

5.31 We asked Dr Martin Lally to:

5.31.1 conduct a review of relevant literature regarding the WACC percentile (see paragraphs 5.8 to 5.9 above); and

5.31.2 elaborate on the reasons for his previous recommendation regarding the WACC percentile.

5.32 In 2008, Dr Lally recommended that we choose "WACC values that are strictly greater than the mid-point of the range".[149]

5.33 Dr Lally continues to support a WACC substantially above the mid-point, suggesting that the 75th percentile is likely to be too low. He concludes:[150]

> …it would be difficult to be definite about the appropriate WACC margin in general, and even more so for specific industries and new versus existing assets, but my sense is that these points collectively suggest that the uniform WACC percentile currently used by the Commission (the 75th percentile) is likely to be too low.

5.34 In reaching this view, Dr Lally builds on Dobbs' analysis because he considers this to be the best available evidence in the literature. However, he highlights several limitations of Dobbs' analysis, which are summarised below.[151]

5.34.1 Dobbs's price elasticity range (-6 to -1.5) is unsuitable for the kind of services regulated by the Commission, and recourse to a more suitable range (zero to -1.5) leads to the conclusion that the WACC percentile applied to assets in aggregate should be raised to at least the 86th percentile.

5.34.2 The fact that firms do not know the true WACC implies that an even higher percentile should be used (assuming that a margin is added to the WACC).

5.34.3 In the event that the allowed WACC is too low, regulators will eventually become aware of this (particularly through observing inadequate investment by firms), and raise their point estimate or margin, and this implies that a lower percentile should be used.

5.34.4 The fact that supernormal WACC allowances will risk inciting excessive investment by firms implies that a lower percentile should be used.

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149 Professor Franks, Dr Lally and Professor Myers "Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology" (18 December 2008), page 37, recommendation 54.

150 Dr Martin Lally "The appropriate percentile for the WACC estimate" (19 June 2014), page 3.

151 Dr Martin Lally "The appropriate percentile for the WACC estimate" (19 June 2014), page 2.

5.34.5 In the presence of benefits received by the owner of a regulated business that flow from, but are not part of, the regulated business ('dual-till' operations), a lower percentile should be used.[152]

5.34.6 The effect of uncertainty about various parameter values used by Dobbs and various modelling assumptions implies that the results obtained should be viewed only as rough indicators.

5.34.7 The appropriate WACC margin will vary across industries, depending upon factors such as the price elasticity, the risk of excessive investment arising from supernormal WACC allowances, the speed with which a regulator would eventually react to an underestimate of WACC, and the presence or absence of 'dual-till' operations.

5.35 Dr Lally also concluded that difficulties in estimating different margins for different industries precludes this course of action, except in circumstances where the appropriate margin is considered to be much lower than normal. He referred to dual-till operations as a possible example of this.[153]

Economic Insights

5.36 Economic Insights conducted a review of overseas regulatory decisions, focusing on whether other regulators use WACC estimates above, below, or at the mid-point. The Economic Insights report assesses regulatory precedents from other jurisdictions, which was one of the main topics raised in the submissions we have received to date.[154]

5.37 Economic Insights' conclusions are summarised below.[155]

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152 Expert reports submitted by interested parties also discussed the role of using a dual-till approach to regulation. See, for example, Covec "Estimating WACC for Airports in New Zealand" (report prepared for Board of Airline Representatives New Zealand Inc, 30 April 2014), pages 16-17; and Professor Puliyur (Sudi) Sudarsanam "An expert's report on the use of a 75th percentile from the WACC range for information disclosure requirements of airports in New Zealand for the purpose of profitability assessment by the Commerce Commission" (expert for Air New Zealand, 4 May 2014), paragraph 4.2.5. As discussed to paragraphs 1.27 to 1.28 above, the WACC percentile for airports (which are subject to a dual-till approach) is not addressed in this draft decision.

153 Dr Martin Lally "The appropriate percentile for the WACC estimate" (19 June 2014), page 3.

154 Oxera "Oxera review of submissions: the appropriate WACC percentile" (17 July 2014), pages 1-2.

155 Economic Insights Pty Ltd "Regulatory Precedents for Setting the WACC within a Range" (16 June 2014).

5.37.1 Most regulators present a range for either the WACC or key parameters in its calculation. Most ranges focus on the return on equity and its underlying parameters. Ranges that are presented are generally not formal statistical confidence intervals, particularly for the WACC as a whole.[156]

5.37.2 The New Zealand Commerce Commission is an exception, because it makes use of a normal distribution and an assumed standard error for the WACC to calculate a range defined by the 25th and 75th percentiles.

5.37.3 Many decisions make no or a relatively small adjustment to the mid-point of a reported range. This often reflects adopting a conservative view of the market risk premium and equity beta that are used in CAPM for determining the return on equity (where 'conservative' means erring on the high side).

5.37.4 The 75th percentile used in New Zealand corresponds to uplifts above the mid-point ranging from 71 to 99 basis points. Basis point uplifts of this size are generally higher than estimates of the uplifts applied in other jurisdictions.

Expert reports submitted on behalf of interested parties

5.38 We have also received a large number of expert reports submitted on behalf of interested parties, particularly in response to our March 2014 process update paper. In that paper we invited interested parties to submit any further evidence or expert reports focusing on:[157]

5.38.1 empirical or analytical evidence regarding the appropriate WACC percentile; and

5.38.2 any additional considerations (supported by evidence) that differ between sectors, which might affect the appropriate WACC percentile.

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156 Rather, ranges used by other regulators are generally estimates from a uniform distribution, where every observation has the same weight.

157 Commerce Commission " Further work on the cost of capital input methodologies: Process update and invitation to provide evidence on the WACC percentile" (31 March 2014), pages 5-6, paragraph 24.

5.39 The expert reports submitted in response to our March 2014 process update paper are briefly summarised below, primarily focusing on their views regarding whether a WACC above the mid-point estimate should be used. The majority of these expert reports were submitted on behalf of regulated suppliers, rather than consumers.

5.39.1 **ASEC** (on behalf of Unison): the Commission should be wary of modifying its long standing position of using the 75th percentile WACC, and clear evidence should be required that any proposed alternative is materially better.[158] ASEC notes that its quantitative estimates support the general proposition that there are economic benefits in setting the WACC above the mid-point.[159] For example, ASEC notes that using the 75th percentile WACC estimate for EDBs results in a deadweight loss of between $174,000 and $214,000 per year, but if the regulated WACC were to decrease, the rational response would be to reduce discretionary investment (eg less undergrounding, leading to higher fault rates), leading to higher costs in the future.[160]

5.39.2 **Castalia** (on behalf of Transpower): argues that the evidence they have gathered strongly suggests that erring on the higher side of the WACC range is likely to be in the long-term interests of consumers.[161] For example, Castalia noted that Transpower's Wairakei Ring investment will provide net economic benefits of approximately $500 million over its life, suggesting that there would only need to be a 4% chance that the project did not proceed for paying the 75th percentile WACC to be in consumers' interests. Castalia also notes that US regulators (like their counterparts in the UK, Australia and New Zealand) specify a reasonable range of returns, and most recent regulatory decisions in the US allow energy utilities to earn returns that sit above the mid-point of the range.[162]

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158 Andrew Shelley Economic Consulting "Selection of the WACC Percentile in the Context of Risks faced by Electricity Distribution" (report prepared for Unison Networks Limited, 29 April 2014).

159 Andrew Shelley Economic Consulting "Selection of the WACC Percentile in the Context of Risks faced by Electricity Distribution" (report prepared for Unison Networks Limited, 29 April 2014), page v.

160 We note that Oxera and Professor Vogelsang have made use of the empirical insights provided by ASEC when forming their views. We note that having regard to consumer welfare, rather than focussing on deadweight loss, may impact on ASEC's conclusions.

161 Castalia Limited "The Rational Response of a Regulated Transmission Company to a Low WACC" (report prepared for Transpower New Zealand Ltd, 1 May 2014), page iv.

162 Castalia Limited "Estimating WACC for Regulated Utilities in the United States" (report prepared for Transpower New Zealand Ltd, 30 April 2014).

5.39.3 **CEG** (on behalf of Orion and Wellington Electricity Lines): it is necessary and appropriate to set the regulatory WACC above the mid-point. However, more time and analysis is required to ascertain the magnitude of the required increment.[163] CEG also compares premiums above government bond rates across recent WACC decisions by other regulators, and found that the premium allowed in New Zealand is materially below the premia allowed in other countries.[164]

5.39.4 **Covec** (on behalf of BARNZ): the WACC range for airports should be centred no higher than the 50th percentile, particularly because: airports are not subject to price control, a dual-till approach to regulation is applied, and airports are in regular consultation with a small group of informed customers.[165]

5.39.5 **Frontier Economics** (on behalf of Transpower): the collective body of available evidence supports an upward shift in the WACC percentile, not a move closer to the mid-point of the range. For example, there are many recent examples of UK regulators allowing a WACC well above the mid-point of the WACC range, the New Zealand approach to individual WACC parameters is less generous to regulated suppliers than approaches used by UK regulators, and there are many alternative (plausible) explanations for the RAB multiple associated with the Powerco transaction.[166]

5.39.6 **Incenta** (on behalf of ENA): there is ample justification for the Commission to set WACC above the mid-point value, due to the potential for under-investment to generate large losses. Given the difficulty of quantifying the link between WACC and investment, it would likely be an impossible exercise to derive a precise answer. The Commission should exercise judgement.[167]

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163 Competition Economists Group "Review of the use of the 75th percentile: A Report for Orion" (report prepared for Orion New Zealand Limited, May 2014).

164 Competition Economists Group "International precedent relevant to the 75th percentile" (report prepared for Wellington Electricity Liens Limited, April 2014).

165 Covec "Estimating WACC for Airports in New Zealand" (report prepared for Board of Airline Representatives New Zealand Inc, 30 April 2014).

166 Frontier Economics Pty Ltd "Evidence on the WACC percentile: A Report prepared for Transpower in response to the Commerce Commission consultation" (report prepared for Transpower New Zealand Ltd, May 2014).

167 Incenta Economic Consulting "Rationale for setting the regulatory WACC above the midpoint value" (report prepared for Electricity Networks Association, May 2014).

5.39.7 **NERA** (on behalf of NZ Airports and Powerco): the 75th percentile should be retained because there are strong qualitative reasons for setting the WACC above an unbiased mid-point estimate, and it is highly likely that the Commission's WACC methodology is downwardly biased. Achieving a precisely defined 'optimal' WACC estimate is likely to be a complex and controversial task; any such analysis will remain heavily reliant on a range of estimates and assumptions.[168]

5.39.8 **NZIER** (on behalf of MEUG): industry specific factors matter - the demand/capacity relationship (by sector) is central to the consideration of which WACC percentile to choose. Partial equilibrium loss functions are likely to be wrong because they overlook certain costs of excess profits and benefits of lower prices. The results from NZIER's computable general equilibrium (CGE) model demonstrate that higher prices for regulated services can shrink the economy.[169]

5.39.9 **Professor Sudarsanam** (on behalf of Air New Zealand): the case for a high percentile (due to premium required by equity investors for asymmetric risk) is not supported from either a conceptual or empirical point of view. Investment incentive arguments for favouring a high percentile are overstated, particularly in the case of airports. The case for a high percentile was not very persuasive to the Civil Aviation Authority (CAA) in the United Kingdom (in recent determinations for Heathrow and Gatwick airports).[170]

5.39.10 **PwC** (on behalf of 21 EDBs): it is appropriate to set the cost of capital above the mid-point of an estimated range, and the 75th percentile was a pragmatic choice. Further, there is no justification for amending the cost of capital range used for information disclosure regulation at this time.[171]

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168 NERA Economic Consulting "Determining the Appropriate Percentile for Setting the Regulatory WACC: A Report for Powerco" (report prepared for Powerco Limited, 30 April 2014); NERA Economic Consulting "Review of the WACC Percentile: A Report for the New Zealand Airports Association" (report prepared for New Zealand Airports Association, 5 May 2014).

169 New Zealand Institute of Economic Research "Review of evidence in support of an appropriate WACC percentile: Response to Commission invitation of 31 March 2014" (report prepared for Major Electricity User's Group, May 2014).

170 Professor Puliyur (Sudi) Sudarsanam "An expert's report on the use of a 75th percentile from the WACC range for information disclosure requirements of airports in New Zealand for the purpose of profitability assessment by the Commerce Commission" (expert for Air New Zealand, 4 May 2014).

171 PricewaterhouseCoopers "Submission to the Commerce Commission on Further work on the cost of capital input methodologies" (submission prepared for 21 EDBs, 5 May 2014).

5.39.11 **Sapere** (on behalf of Vector): the available analytical evidence, and inferences from investment decisions, supports adopting at least the 75th percentile to account for the risks of parameter error.[172] Economic theory seems unambiguous - the economic loss to society is higher if WACC is under-estimated than if it is over-estimated. Allowance should also be made for model error. Sapere also discusses different forms of loss functions, including piece-wise linear and LINEX loss functions, where the loss from estimation error is asymmetric.[173]

5.39.12 **UniServices** (on behalf of NZ Airports): asymmetric downside risks are likely to differ between industries, in both the level and quantum of asymmetric risks. If the Commission agrees that asymmetric risk is relevant to the choice of the percentile, then it should consider the different types and quantum of asymmetric risks for EDBs, Gas Pipeline Businesses (GPBs) and Airports.[174]

5.40 The expert reports submitted by interested parties are addressed in greater detail in the review of submissions that Oxera prepared for us.[175] Oxera identified four key themes in submissions, in addition to the analysis described in its report dated 23 June 2014. These key themes were asymmetric risks (such as asset stranding and natural disasters), the risk of model error, regulatory precedents from other jurisdictions, and sector-by-sector differences.[176]

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172 Sapere used data from Vector's 2012-2013 information disclosure to provide an order of magnitude estimate of the size of the potential welfare loss from a WACC that is set too high (and thus results in higher prices), compared to the potential welfare loss to consumers that would arise if the WACC was set below the true WACC for illustrative investment decisions.

173 Sapere Research Group "Setting the WACC percentile for Vector's price quality path" (report prepared for Vector Limited, 5 May 2014).

174 Auckland UniServices Ltd "Comment on "Further work on the Cost of Capital Input Methodologies. Commerce Commission invitation to provide evidence on the WACC percentile"" (report prepared for New Zealand Airports Association, 1 May 2014).

175 Oxera "Oxera review of submissions: the appropriate WACC percentile" (17 July 2014).

176 Asymmetric risks are discussed in paragraphs 4.16 to 4.18 of this report, the risk of model error is discussed in paragraphs 4.14 to 4.15, regulatory precedents from other jurisdictions are discussed in paragraphs 5.36 to 5.37, and sector-by-sector differences are discussed in paragraphs 6.45 to 6.52.

The evidence we have gathered supports using a WACC above the mid-point estimate

5.41 After gathering further evidence, and conducting additional analysis, our view remains that it is appropriate to use a WACC above the mid-point estimate. This is because:

5.41.1 the quantitative analysis conducted by Oxera and Dr Lally demonstrates that using a WACC above the mid-point estimate helps mitigate significant risks to consumers that would result from under-investment;

5.41.2 overall, the other available evidence provides substantial support for using a WACC above the mid-point estimate for electricity lines and gas pipeline businesses; and

5.41.3 the impact on downstream industries of using a WACC above the mid-point is unlikely to be material to our decision.

A WACC above the mid-point helps mitigate significant risks of under-investment

5.42 In our view, it is appropriate to use a WACC above the mid-point estimate to avoid significant risks to consumers that would result from under-investment. The costs of under-investment resulting from a WACC that is too low are likely to be significantly higher than the costs of over-investment resulting from a WACC that is too high, within the range of uncertainty regarding investors' required rate of return for electricity lines and gas pipeline businesses.

5.43 In its report, Oxera trades-off the likely costs and benefits of using a WACC above the mid-point estimate, for various percentiles.

5.43.1 If the WACC is too high, consumers will pay higher prices and suppliers may over-invest due to the high returns they are able to earn. Oxera directly estimates the costs to consumers resulting from using various WACC estimates above the mid-point.

5.43.2 Although the costs to consumers from under-estimating WACC are difficult to measure, Oxera notes that the "…potential costs of under-investment are material…" and evidence from events in other countries suggests that a severe outage resulting from under-investment "…could result in a cost with an annualised economic value equivalent to over NZ$1bn".[177]

[177] Oxera "Input methodologies: Review of the '75th percentile' approach" (23 June 2014), page 6.

5.44 Overall, Oxera concludes that the mid-point WACC estimate is likely to be too low, and some premium for customers to reduce the risk of under-investment appears "reasonable and proportionate".[178] Specifically, Oxera recommends using a WACC between the 60th and 70th percentile estimates.

5.45 We agree with Oxera's conclusion that a WACC above the mid-point estimate should be used. In reaching this view, we have considered several additional factors which are relevant to Oxera's analysis, but which are likely to have an off-setting effect. These factors are described in paragraph 6.7 below. For example:

5.45.1 Oxera's analysis is primarily focused on reliability investments, which are targeted at reducing the risk of outages (and the resulting costs to consumers). Factoring in potential benefits from other types of investment, for example increased innovation, is likely to strengthen the case for using a WACC above the mid-point estimate.

5.45.2 Oxera has not included annual cost savings to consumers, due to reduced investment in the future, that would result if a lower WACC percentile was used. Considering these annual cost savings to consumers is likely to weaken the case for using a WACC above the mid-point estimate.

5.46 The analysis conducted by Dr Lally, building on the approach developed by Professor Dobbs, also supports using a WACC above the mid-point estimate. Dr Lally concludes that the 75th percentile estimate is likely to be too low.[179]

5.47 Although we consider that a WACC above the mid-point estimate should be used, we note that this is not the only regulatory instrument available to help mitigate potential under-investment by suppliers. For example, quality standards applied under price-quality path regulation are also likely to help maintain network reliability. In some circumstances, instruments other than the WACC percentile may be preferred to help mitigate the risk of under-investment.

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178 Oxera "Input methodologies: Review of the '75th percentile' approach" (23 June 2014), page 73.

179 Dr Martin Lally "The appropriate percentile for the WACC estimate" (19 June 2014), page 3.

The available evidence supports using a WACC above the mid-point estimate

5.48 In summary, the available evidence provides substantial support for adopting a WACC above the mid-point estimate.

5.48.1 All our independent expert advisors who commented on this issue agree that a WACC above the mid-point should be used.[180]

5.48.2 There have been a large number of submissions and expert reports which provide analytical (and some empirical support) for using a percentile above the mid-point.

5.48.3 Overseas regulators often adopt a WACC above the mid-point of the range, sometimes by using estimates of individual parameters which are generous in favour of suppliers.

5.49 In our view, none of the submissions we have received to date provide compelling evidence or reasons for using a WACC at (or below) the mid-point estimate for energy businesses.

5.50 For example, MEUG argued in the IMs merits appeals that the mid-point WACC estimate should be used. However, the report submitted by MEUG's expert advisor, NZIER, in response to our March 2014 request for empirical or analytical evidence regarding the appropriate WACC percentile, did not strongly argue for using the mid-point WACC estimate. Rather, NZIER found that the optimal WACC percentile is significantly above the mid-point under certain assumptions.

5.51 Specifically, building on Professor Dobbs' partial equilibrium analysis, NZIER concluded that the welfare-maximising WACC percentile is highly sensitive to the ratio of sunk assets to new investment, and assumptions about the functional form of demand (and demand elasticity). It found that:[181]

> The [constant elasticity of demand] case shows the optimal WACC percentile is everywhere above the mid-point while the linear case shows that the optimal WACC percentile is the first percentile whenever new investment is less than 15% of asset value, jumping to an optimal percentile of WACC of 80% when new investment rises above 15% of assets.

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180 Economic Insights did not provide a view on whether a WACC above the mid-point should be used, because its report is focussed on summarising the approaches taken by other regulators (rather than recommending the approach we should use).

181 New Zealand Institute of Economic Research "Review of evidence in support of an appropriate WACC percentile: Response to Commission invitation of 31 March 2014" (report prepared for Major Electricity User's Group, May 2014), pages 18-19.

5.52 NZIER tested the extent to which real-world model values might affect its results, using values indicative of Transpower's business and demand. It concluded:[182]

5.52.1 under constant elasticity of demand, the optimal WACC percentile is at the bottom of the WACC distribution for proportions of new investment less than 7%, with optimal percentiles above the 84th percentile (steadily rising towards the 98th percentile) beyond that point; and

5.52.2 under linear demand (plus adjustments for the form of regulation), the optimal WACC percentile is at the bottom of the distribution wherever the proportion of new investment is less than 38%. Above this point, the optimal WACC is greater than the 78th percentile (steadily rising towards a maximum of the 89th percentile).

5.53 NZIER also conducted general equilibrium analysis, examining the effects across the wider economy from a shock in electricity prices. NZIER concluded that prices which invite investment in regulated assets include wider economic costs which are not factored into partial equilibrium models, and also factor in benefits which are illusory.[183]

5.54 NZIER concluded that its analysis "…does not have a great deal to add in terms of what the 'right' WACC percentile is", but rather suggests "…that the shape of partial equilibrium loss functions are likely to be wrong because they overlook certain costs of excess profits and benefits of lower prices".[184]

5.55 The submissions from Covec and Professor Sudarsanam argue for using the mid-point WACC for specified airport services, however, this is at least partly due to airport-specific factors (such as the role of using a dual-till approach to regulation). As discussed earlier, we have not yet fully considered the airport-specific parts of these submissions, so airports are not addressed in this draft decision.

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182 New Zealand Institute of Economic Research "Review of evidence in support of an appropriate WACC percentile: Response to Commission invitation of 31 March 2014" (report prepared for Major Electricity User's Group, May 2014), pages 19-20.

183 New Zealand Institute of Economic Research "Review of evidence in support of an appropriate WACC percentile: Response to Commission invitation of 31 March 2014" (report prepared for Major Electricity User's Group, May 2014), page ii.

184 New Zealand Institute of Economic Research "Review of evidence in support of an appropriate WACC percentile: Response to Commission invitation of 31 March 2014" (report prepared for Major Electricity User's Group, May 2014), page ii.

The impact on downstream industries is unlikely to be material to our decision

5.56 One 'in-principle argument' that the Court presented against using a WACC above the mid-point was that, as well as being used by final consumers, the outputs of regulated suppliers are inputs to numerous other sectors of the economy. The Court stated:[185]

> If the prices paid by user industries are higher than the resource cost of producing the outputs (viz, electricity and gas transmission and distribution), then inefficiency is promulgated throughout the economy. That is what is implied by higher than normal expected returns.
>
> At the least, the inter-sectorial effects ought to be considered, and if possible estimated. This has not been done in the present regulatory processes.

5.57 As we noted in our February 2014 consultation paper, we have previously focused solely on costs and benefits that occur directly in the relevant regulated market.[186] This is because the flow-on effects in other markets are, under certain assumptions, fully reflected in the primary market.

5.58 The Court's comments regarding downstream industries have been considered by our advisors, Dr Lally and Oxera. They both conclude that the impact on downstream industries is unlikely to be material to our decision regarding the WACC percentile.

5.58.1 Dr Lally acknowledges, as suggested by the Court, that the outputs of regulated businesses are inputs to other sectors of the economy (as well as to final consumers) and therefore WACC margins will be likely to induce allocative inefficiency throughout other sectors of the economy. However, he argues that as long as the price elasticity for the product in question is properly estimated, and reflected in the choice of WACC margin, there is no need to additionally consider the extent to which the product is used as an input to other sectors of the economy.[187]

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185 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [11 December 2013], paragraphs 1475-1476.

186 Commerce Commission "Invitation to have your say on whether the Commerce Commission should review or amend the cost of capital input methodologies" (20 February 2014), pages 16-17, paragraphs 46-48.

187 Dr Martin Lally "The Appropriate Percentile for the WACC Estimate" (19 June 2014), page 18.

5.58.2 Oxera undertakes empirical analysis of two possible indirect effects resulting from prices to downstream industries being different to the competitive level: investment incentives across the supply chain, and the competitiveness of New Zealand companies (with high energy consumption) that export a significant amount of their product. Oxera notes that these secondary effects are likely to be small, relative to any direct price effect. Oxera concludes that the scale of any such effects is unlikely to be material to the decision on an appropriate percentile for the WACC.[188]

5.59 Cost-benefit analysis theory supports the view that the impact in downstream markets is unlikely to be material to our decision regarding the WACC percentile. For example, a relevant text book on the subject discusses the approach to valuing benefits and costs in secondary markets, concluding that effects in secondary markets "…often can (and indeed should) be ignored in conducting [cost-benefit analysis]".[189]

5.60 For the reasons described above, considering the likely effects of a higher WACC on the rest of the economy does not change our view regarding the appropriate percentile.

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188 Oxera "Input Methodologies: Review of the 75th percentile approach" (17 June 2014), pages 35-39.

189 Boardman A., Greenberg D. H., Vining A. R., Weimer D. L., *Cost-Benefit Analysis: Concepts and Practice*, Prentice Hall, 4th Edition, 2011, page 115.

6. Our view regarding the appropriate WACC percentile

6.1 Having concluded that a WACC above the mid-point estimate should be used, this section describes our view regarding the appropriate WACC percentile. In reaching our view we:

6.1.1 first consider reasonable lower and upper bounds for the WACC percentile for price-quality path regulation, based on the evidence we have collected;

6.1.2 discuss the observed RAB multiples for Powerco and Vector, which provide evidence that the 75th percentile is more than sufficient to compensate investors for putting their capital at risk;

6.1.3 apply judgement to reach a view regarding the appropriate point estimate of the WACC percentile for price-quality path regulation; and

6.1.4 determine the WACC range for information disclosure regulation, in light of our conclusions regarding the WACC percentile for price-quality path regulation.

6.2 This section also presents our estimate of the impact on consumer payments and supplier returns from reducing the WACC from the 75th percentile to the level we now consider appropriate (the 67th percentile).

Evidence suggests the appropriate WACC is between the 60th and 75th percentile

6.3 We have used the available evidence to determine reasonable lower and upper bounds for the WACC percentile for price-quality path regulation. In our view, the evidence suggests that the:

6.3.1 lower bound is the 60th percentile WACC estimate; and

6.3.2 upper bound is the 75th percentile WACC estimate.

The lower bound is the 60th percentile WACC estimate

6.4 In the previous chapter we concluded that the available evidence supports using a WACC significantly above the mid-point estimate.

6.5 In our view, the 60th percentile is an appropriate lower bound when considering the WACC percentile for price-quality path regulation. We consider that the 60th percentile is the minimum percentile that might balance the relative costs of over- or under-estimating WACC.

6.6 In reaching this view, we note that Oxera concluded that:[190]

6.6.1 the 50th percentile is likely to be too low; and

6.6.2 a range from the 60th to the 70th percentile appears to provide a suitable balance between the costs and benefits of using a WACC above the mid-point estimate.

6.7 However, there are several off-setting factors we have considered which potentially impact on Oxera's recommended range, as well as the choice of percentile within that range. In particular:

6.7.1 Oxera has not considered annual cost savings to consumers, due to reduced investment in the future, that would result if a lower WACC percentile was used. Instead, Oxera considers only static consumer welfare effects resulting from a change in the WACC percentile, for a given RAB value.[191] According to Professor Vogelsang, this weakens "…Oxera's soft recommendation of a WACC in the 60th to 70th percentile range…" and instead indicates "…a somewhat lower percentile".[192]

6.7.2 Oxera's analysis is primarily focused on reliability investments, which are targeted at reducing the risk of outages (and the resulting costs to consumers). Factoring in potential benefits from other types of investment (for example increased innovation, or investment designed to reduce grid congestion) is likely to strengthen the case for using a WACC above the mid-point estimate.[193]

6.7.3 Oxera has not modelled the possible effect of over-investment resulting from a higher WACC percentile, although it notes that this is a possibility. Factoring in the risk of over-investment will tend to reduce the preferred WACC range.

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190 Oxera "Input Methodologies: Review of the 75th percentile approach" (23 June 2014), page 73.

191 Professor Ingo Vogelsang "Review of Oxera's Report, Input methodologies - Review of the '75th percentile' approach" (10 July 2014), pages 8-9, paragraph 18.

192 Professor Ingo Vogelsang "Review of Oxera's Report, Input methodologies - Review of the '75th percentile' approach" (10 July 2014), page 3, paragraph 14.

193 In a submission on behalf of Transpower, Castalia considers the possible impact of a low WACC on consumers across different forms of investment. Castalia Limited "The Rational Response of a Regulated Transmission Company to a Low WACC" (report prepared for Transpower New Zealand Ltd, 1 May 2014), page 16, table 5.1. This is considered further in Attachment C.

6.7.4 There are also other financial and non-financial incentives to maintain reliability which Oxera has not explicitly incorporated into its quantitative analysis, but did have regard to when reaching its recommended WACC range. For example, under price-quality path regulation we set quality standards which suppliers are required to meet.[194]

6.7.5 Oxera referred to "…other factors that are not explicitly reflected in the current approach to defining the percentile, but which might nevertheless point to a cautious approach in setting the percentile either high or low".[195] Oxera noted that this could include things such as the risk of model error, or incremental risks within regulatory periods around parameters such as the risk-free rate.[196]

6.8 Considering all of these factors, on balance we consider that the 60th percentile is a reasonable lower bound for the WACC percentile for price-quality path regulation.

The upper bound is the 75th percentile WACC estimate

6.9 In our view, the 75th percentile is an appropriate upper bound when considering the WACC percentile for price-quality path regulation. In reaching this view, we note that:

6.9.1 there is some analytical support for using a WACC above the 75th percentile estimate; however

6.9.2 evidence of observed investment suggests that the 75th percentile WACC is (more than) sufficient to incentivise investment.

There is some support for using a WACC above the 75th percentile estimate

6.10 There is some analytical support for using a WACC above the 75th percentile estimate. For example:

6.10.1 Dr Lally's view is that the 75th percentile is likely to be too low; and

6.10.2 some submissions suggest that we should adopt at least the 75th percentile WACC estimate.

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194 See paragraphs 3.17 to 3.30 above for further discussion on wider incentives operating under price-cap regulation.

195 Oxera "Input Methodologies: Review of the 75th percentile approach" (23 June 2014), page 74.

196 However, as discussed in paragraph 4.14 above, the mid-point is our best estimate of WACC; in our view, no bias in the mid-point has been demonstrated.

6.11 In reaching his view that the 75th percentile is likely to be too low, Dr Lally built on the analysis contained in the Dobbs paper, which is also indicative of using a WACC estimate higher than the 75th percentile under certain assumptions.[197]

6.12 Dr Lally modified Dobbs' analysis by substituting elasticities he considers are more relevant to regulated businesses. He also noted a number of factors which Dobbs did not include in his model, but which might affect the preferred WACC percentile.[198]

6.13 Dr Lally and Professor Dobbs both use a total welfare approach when considering the appropriate WACC percentile. Since we consider consumer welfare is also relevant, Dr Lally's and Professor Dobbs' views regarding the appropriate WACC percentile are likely to be too high when considered in the Part 4 framework. However, Dr Lally notes that "…substitution of consumer surplus for total surplus in the Dobbs analysis would still lead to a substantial WACC margin for new investment".[199]

6.14 Further, we consider that market constraints will limit the extent to which investors or management are likely to over-estimate WACC. These constraints will limit the dispersion of any such estimates around the mean. For example, investors who over-estimate WACC (and therefore under-value their companies) will tend to sell their shares to other investors. While decisions are made by managers rather than owners, managers who over-estimate WACC (and therefore under-value potential projects) will tend to be replaced by owners of the company.

6.15 Other features of the regulatory regime also suggest that the WACC should not be higher than the 75th percentile. For example:

6.15.1 quality standards (with significant civil and criminal penalties) will reduce the likelihood of the highest cost theoretical outcomes associated with under-investment;[200]

6.15.2 efficiency gains in both capex and opex provide a buffer if returns are falling short of target, or the allowed WACC for that period is too low. The IRIS strengthens incentives to economise on expenditure by potentially allowing suppliers to keep savings beyond the next reset; and

6.15.3 we are able to monitor the investment of regulated businesses and take action if we see evidence of under-investment.

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197 Dobbs, I., 2011. Modelling Welfare Loss Asymmetries Arising from Uncertainty in the Regulatory Cost of Finance, *Journal of Regulatory Finance* 39, 1-28.

198 See paragraph 5.34 above for further details.

199 Dr Martin Lally "The appropriate percentile for the WACC estimate" (19 June 2014), page 21.

200 We note that Professor Dobbs' approach implicitly assumes that existing investment will be replaced, as required to maintain system reliability.

6.16 In its submission on behalf of Transpower, Frontier Economics argued that "recent regulatory practice from the UK supports the practice of choosing at least the 75th percentile of the WACC range".[201] Similarly, Sapere (for Vector) stated that the "…available analytical evidence, and inferences from investment decisions, certainly support the Commission adopting at least the 75th percentile, if not higher…".[202]

6.17 However, for the reasons explained by Economic Insights, it is not valid to compare percentile estimates from UK regulatory decisions (as Frontier Economics has done) with the 75th percentile approach used in New Zealand. Specifically, Economic Insights states:[203]

> Care needs to be taken in comparing reported percentiles from ranges that are not constructed in the same way…
>
> …it is not valid to compare a percentile from a normal distribution (as used by the Commerce Commission) with a percentile from what is in effect assumed to be a uniform distribution (a uniform distribution gives the same weight to every point in the range) for other regulators.

6.18 Further, Oxera considered the case for using a WACC above the 75th percentile, but concluded that this appears to result in "…a potentially excessive level of protection…" against the under-investment problem. For example, when considering the case for using the 80th percentile, Oxera stated that this would imply that:[204]

> …customers are paying as much for protection within a seven-year IM period as our analysis indicates could be the potential annualised cost of material outages. Given that the Commission has other regulatory measures in place to offset the risk of under-investment, and is strengthening these measures, this appears to be a potentially excessive level of protection.

6.19 More importantly, evidence of observed investment in New Zealand strongly supports not using a WACC above the 75th percentile estimate. This evidence is discussed in paragraphs 6.20 to 6.28 below.

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201 Frontier Economics Pty Ltd "Evidence on the WACC percentile: A Report prepared for Transpower in response to the Commerce Commission consultation" (report prepared for Transpower New Zealand Ltd, May 2014), page 3.

202 Sapere Research Group "Setting the WACC percentile for Vector's price quality path" (report prepared for Vector Limited, 5 May 2014), page 6.

203 Economic Insights Pty Ltd "Regulatory Precedents for Setting the WACC within a Range" (16 June 2014), page 4.

204 Oxera "Input Methodologies: Review of the 75th percentile approach" (23 June 2014), pages 73-74.

Observed investment suggests the 75th percentile is (more than) sufficient to incentivise investment

6.20 Significantly, although there is some interesting analytical support for a WACC higher than the 75th percentile, this is not supported by observed investment from both regulated businesses and investors. This evidence strongly suggests that a WACC above the 75th percentile estimate has turned out to be higher than is required to meet the rate of return expectations of investors (and their agents), given our implementation of regulation under Part 4 of the Commerce Act.

6.21 Our decision to use the 75th percentile WACC estimate in the 2010 IMs was made at the beginning of the new regulatory regime under Part 4 of the Commerce Act. It was made at a time when we had limited information on the likely response of regulated businesses (and investors) to the 75th percentile WACC.

6.22 However, we now have experience operating under the IMs determined in 2010. There is no evidence of systematic under-investment, or of declining service reliability, from businesses subject to price-quality path regulation under Part 4 of the Commerce Act.[205]

6.23 Rather, evidence suggests that regulated energy businesses have continued to undertake significant capital expenditure under the 75th percentile WACC. Actual and forecast growth in the value of regulated assets for EDBs subject to default price-quality path regulation (excluding revaluations), and Transpower, is shown in Figure 6.1 and Figure 6.2 below (respectively).[206]

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[205] NZIER notes that the only formal review of the arguments for a WACC above the mid-point that they are aware of, undertaken by the Australian Competition Tribunal in 2009, concluded that there was no evidence for using a WACC above the mid-point, and that a 'capital strike' was unlikely because of investors' heterogeneous expectations. New Zealand Institute of Economic Research "Review of evidence in support of an appropriate WACC percentile: Response to Commission invitation of 31 March 2014" (report prepared for Major Electricity User's Group, May 2014), page 8.

[206] Figure 6.1 shows the value of regulated assets for EDBs subject to default price-quality path regulation only. Therefore, Orion (which is subject to a customised price-quality path) is excluded. Figure 6.1 takes opening RAB for 2009, adds commissioned assets, and subtracts depreciation reported in schedule 4(i) of ID and forecast for DPP (but does not add amounts for annual revaluations). However, the depreciation numbers reflect annual CPI revaluations. The use of depreciation charges based on revalued assets (as shown in Figure 6.1) results in a marginally flatter graph than if depreciation based on an un-revalued RAB had been used instead.

Figure 6.1: Actual and forecast growth in the value of regulated assets for EDBs

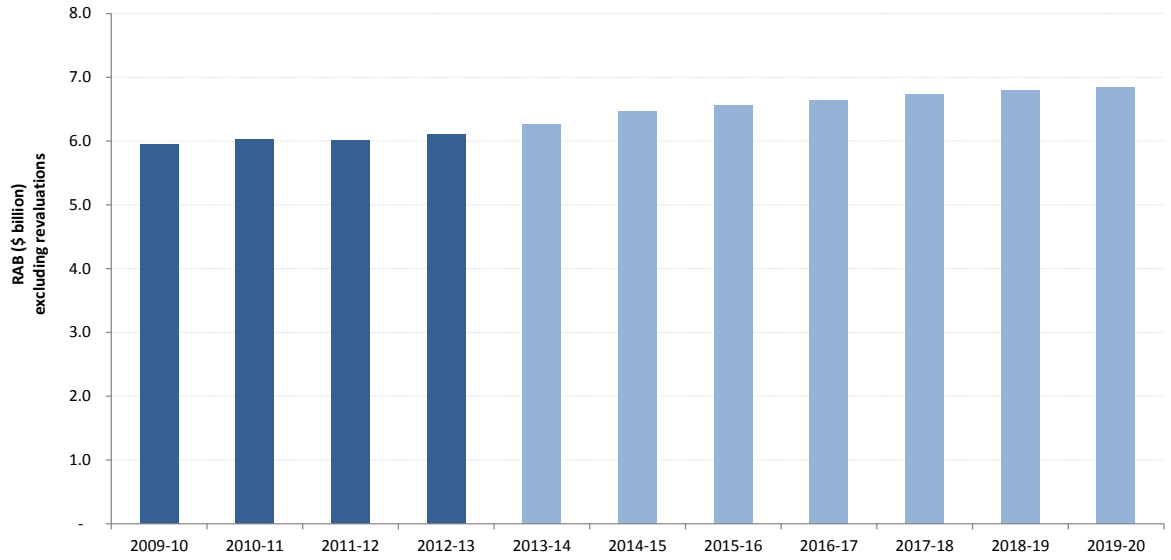
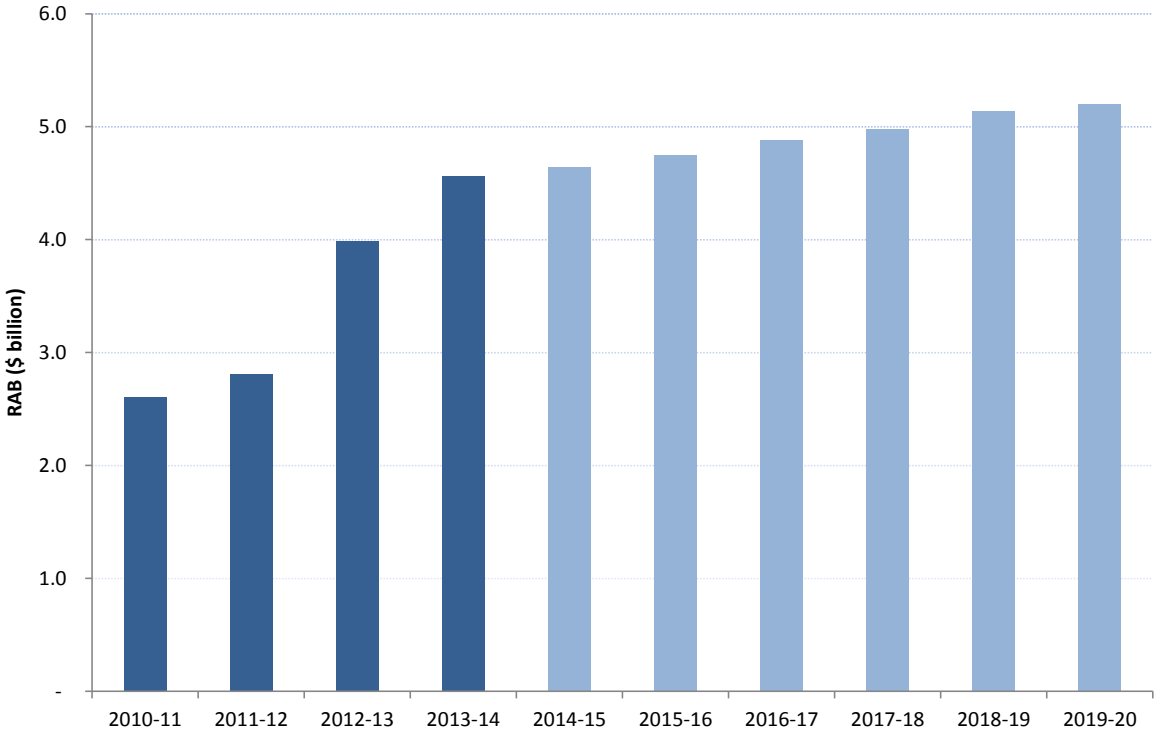


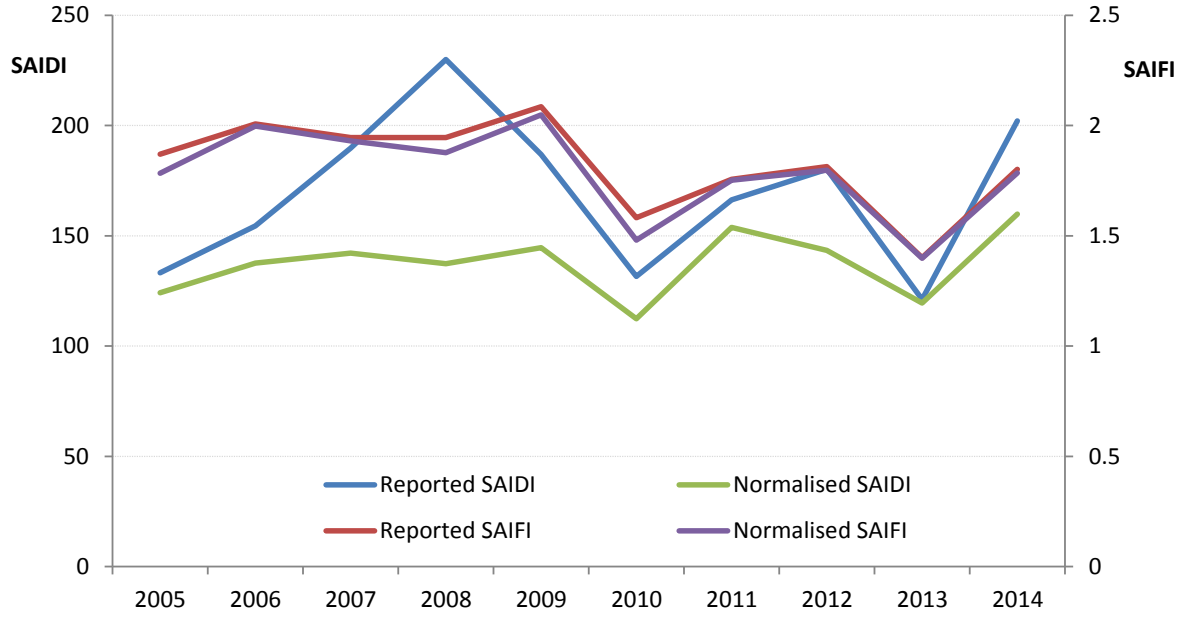
Figure 6.2: Actual and forecast RAB for Transpower



6.24 The growth in value of regulated assets for EDBs and Transpower demonstrates that continued investment has been occurring over time, and is forecast to continue to occur, under the 75th percentile WACC estimate.

6.25 If regulated suppliers were undertaking insufficient levels of investment, this could be expected to lead to declining network reliability. However, data on the average duration and frequency of interruptions for EDBs indicates that there is no clear evidence of declining service reliability over time.[207] SAIDI and SAIFI for EDBs subject to price-quality path regulation is shown in Figure 6.3 below.[208]

Figure 6.3: SAIDI and SAIFI for EDBs subject to default price-quality path regulation



6.26 Further, Transpower reported a decline in unplanned supply interruptions over the period from 2007/08 to 2012/13.[209] Transpower also has a range of initiatives in progress to achieve sustained improvements in performance, and to reduce interruptions.[210]

6.27 Evidence from recent transactions between investors in regulated businesses also suggests that the 75th percentile WACC estimate is more than sufficient to incentivise investment. In particular:

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207 The technical term for the average duration of interruption is System Average Interruption Duration Index (SAIDI), and the technical term for the average frequency of interruption is System Average Interruption Frequency Index (SAIFI).

208 A report by The Brattle Group for the Australian Energy Market Commission provides international comparisons of SAIDI and SAIFI. The Brattle Group "Approaches to setting electric distribution reliability standards and outcomes" (January 2012).

209 Transpower “Quality Performance Report 2012/13”, page 6, figures 1, 3 and 4.

210 Transpower “Quality Performance Report 2012/13”, pages 3-4.

6.27.1 there was strong investor interest from a range of parties (including international players) in purchasing a 42% stake in Powerco, and favourable comment on regulatory settings in New Zealand;[211] and

6.27.2 the enterprise values of both Powerco and Vector are significantly greater than the corresponding RAB values (particularly for Powerco), indicating that the regulatory rate of return is more than sufficient to compensate investors for putting their capital at risk.[212] Further discussion regarding the enterprise values for Powerco and Vector, relative to their RAB values, is contained in paragraphs 6.29 to 6.36 below and in Attachment A.

6.28 In our view, the empirical observations of significant and ongoing capex from regulated suppliers, no decline in service reliability, and the RAB multiples for Powerco and Vector, outweigh any theoretical arguments for increasing the WACC above the 75th percentile estimate. Therefore, we consider the 75th percentile to be a reasonable upper bound for the appropriate WACC percentile.

RAB multiples for Powerco and Vector suggest the WACC percentile should be reduced

6.29 When determining the appropriate WACC percentile, we have considered estimates of the implied commercial values of Powerco and Vector, relative to each company's RAB (ie, RAB multiples).[213]

6.30 The RAB multiple of a regulated business is the ratio of its enterprise value to its RAB.[214] RAB multiples can provide a useful indicator of whether the regulatory rate of return has been set at a level sufficient to adequately compensate investors for putting their capital at risk.

6.31 At its simplest, the concept is that (in the absence of other factors) a business will deliver returns close to its 'true' cost of capital. That is, the net present value of expected cash flows should, if the regulator's assumptions hold, equal the value of the RAB (ie, the RAB multiple should be 1.0).

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211 Acquisition International "Power Grab - AMP Capital's acquisition of Powerco stake" (October 2013), page 9.

212 Powerco and Vector together comprise 40.7% of the total RAB for EDBs.

213 Vector and Horizon are the only two publicly listed energy businesses that are regulated under Part 4 of the Commerce Act. We have placed limited weight on the RAB multiple for Horizon for the reasons explained in Attachment A.

214 The enterprise value is calculated as the sum of the market value of net debt and the market value of the shareholders' equity.

6.32 However, in an incentive-based regulatory regime, the RAB multiple will not only reflect the relationship between the regulatory allowed rate of return and investors' views of WACC, but also the market's expectations of the company's ability to over- or under-perform relative to the regulator's cash-flow and other modelling assumptions.

6.33 On this basis, a RAB multiple of greater than 1.0 could imply either:

6.33.1 the regulatory allowed rate of return was too high; or

6.33.2 the market expected the company to out-perform cash-flow or other model assumptions used in their regulatory determination.

6.34 Our analysis of the RAB multiples for Powerco and Vector is summarised below. Further details are available in Attachment A.

6.34.1 **Powerco:** in July 2013, AMP Capital announced the acquisition of 42% of Powerco Ltd for $525 million, implying an enterprise value of $1.25 billion and a RAB multiple of 1.33x. Powerco's RAB multiple of greater than 1.3x is significant, particularly given the underlying transaction relates to AMP Capital acquiring only a 42% stake in Powerco, so the purchase price is unlikely to be significantly affected by assumed synergies or control premiums.

6.34.2 **Vector:** we estimate a RAB multiple for Vector's regulated businesses (gas and electricity) in the range of 1.09x to 1.16x. While this is less than the RAB multiple for Powerco, Vector is still trading at a significant premium to RAB. Vector's RAB multiple is unlikely to be explained by outperformance, since its electricity distribution price-quality path (which comprises the bulk of its regulated assets) is due to be reset in April 2015.[215]

6.35 Overall, the RAB multiples evidence for Powerco and Vector suggests that the 75th percentile WACC estimate is above these businesses' actual WACCs. Powerco and Vector together constitute 40.7% of the total RAB value for EDBs.

[215] Electricity distribution accounts for over 70% of Vector's aggregate RAB. Gas price-quality paths are due to be reset in 2017. We acknowledge that the price investors pay may reflect the expectation that a supplier can make efficiency gains in future regulatory periods.

6.36 Submitters have identified several reasons which, in theory, could explain why a firm's enterprise value exceeds its RAB. Our detailed responses to these submissions are contained in Attachment A. In summary, we conclude that:

6.36.1 none of the factors raised in submissions properly explain the size of (in particular) Powerco's premium over RAB; and

6.36.2 these submissions do not provide good reasons why we should not reduce the WACC percentile.

Our judgement is that the 67th percentile WACC estimate is appropriate

6.37 Considering all of the available evidence, our view is that the 75th percentile WACC estimate is too high. Therefore, we intend to make a downwards adjustment to the WACC percentile for price-quality path regulation.

6.38 The evidence suggesting the WACC should be reduced below the 75th percentile that we consider to be the most persuasive is:

6.38.1 Analysis of the RAB multiples for Powerco and Vector indicates that our 75th percentile WACC estimate is above the market's implied view of WACC for these businesses. Although submissions have raised several reasons which could explain why a firm's enterprise value exceeds its RAB, we are not persuaded that these factors can adequately explain the observed RAB multiples.

6.38.2 The quantitative analysis conducted by Oxera, adopting the loss function approach supported by the Court, indicates that a WACC below the 75th percentile estimate is appropriate.[216] Specifically, Oxera recommend using a WACC between the 60th and 70th percentile estimates. We have drawn on Oxera's framework, and other relevant factors, when forming our conclusions regarding the WACC percentile. There are several off-setting considerations which may affect the conclusions of Oxera's analysis (as discussed in paragraph 6.7 above) but, on balance, we place weight on Oxera's view that a percentile below the 75th is appropriate.

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216 In his peer-review Professor Vogelsang noted that Oxera's report "…goes a significant way towards fulfilling the High Court's aspirations for a NZCC decision on the optimal percentile of the WACC distribution" and provides a "…sound empirical base for a decision". Professor Ingo Vogelsang "Review of Oxera's Report, Input methodologies - Review of the '75th percentile' approach" (10 July 2014), page 1, paragraph 2.

6.38.3 Professor Vogelsang's insight that if the current level of investment is optimal, the impacts of changes in investment on reliability are likely to be relatively minor. While we do not know if current investment levels are optimal, strong investment has been occurring (and is forecast to continue to occur) and there is no evidence that it is inadequate to satisfy consumers' needs.[217]

6.38.4 There are other tools to help incentivise efficient investment from regulated suppliers, in addition to the WACC percentile. For example, required quality standards (and associated penalties) help reduce the risk of under-investment. We are able to monitor the investment of regulated businesses and take action if we become concerned about under-investment or declining quality of service. Elements of the IMs and price-quality paths can be amended in response to observed investment levels and quality, if required.[218]

6.38.5 A range of other factors, including investors' long-term ownership interests, suppliers' need to credibly forecast expenditure in future price resets, and the desire of Board and management to ensure the lights do not go out, also combine to produce incentives to invest efficiently. In our view, continued use of the 75th percentile estimate would place too much emphasis on the WACC as the source of incentives to invest, relative to the contribution from these other factors.

6.39 Further, the review of UK, European, Australian, and US regulatory decisions conducted by Economic Insights found that our use of the 75th percentile results in basis points uplifts to WACC which are "generally higher than the estimates from other jurisdictions".[219] Economic Insights has compared basis point adjustments to the mid-point of the WACC ranges reported by other regulators, to ensure like-for-like comparisons across jurisdictions.[220]

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217 We are open to evidence regarding the optimality of current levels of investment by regulated suppliers.

218 For example, as part of the current price-quality path resets for EDBs and Transpower we have proposed revenue-linked quality incentive schemes. These schemes provide improved incentives for suppliers to efficiently invest in service quality.

219 Economic Insights Pty Ltd “Regulatory Precedents for Setting the WACC within a Range” (16 June 2014), page iv.

220 This is in contrast to the approach used by Frontier Economics, who compared WACC percentiles from UK regulatory decisions (based on a uniform distribution) with the 75th percentile approach used in New Zealand (based on a normal distribution). See paragraph 6.17 above for further details.

6.40 Economic Insights also referred to other features of UK regulatory decisions regarding the cost of capital, highlighted in the Frontier Economics submissions for Transpower, as potentially providing more generous allowances than in New Zealand.[221] However, as discussed in paragraph 4.14 above, the mid-point is our best estimate of WACC, no bias in the mid-point has been demonstrated, and if bias in the mid-point was demonstrated our view is that this should be addressed directly (rather than indirectly, via the WACC percentile).

6.41 Due to fundamental uncertainty regarding the link between the WACC allowed by the regulator, the level of investment by regulated suppliers, how this affects quality of service, and the resulting impact on economic welfare, it is not possible (based on the available data) to define a specific WACC percentile based purely on empirical evidence. Rather, for the reasons described in paragraphs 4.5 to 4.9 above, judgement is required when determining the appropriate WACC percentile.[222]

6.42 After exercising judgement in light of the available evidence, we have concluded that a percentile significantly below the upper bound we selected is appropriate. In our view, a percentile around the middle of the reasonable range we have defined (ie from the 60th to the 75th percentile) appropriately balances the relative costs to consumers of under- and over-investment. We have settled on the 67th percentile.[223]

6.43 We note that although the expert reports submitted by interested parties generally build a strong case for using a WACC above the mid-point estimate for energy businesses, they provide limited analytical or empirical evidence to support the specific choice of the 75th percentile estimate over the 67th percentile estimate, which is still a substantial uplift from the mid-point.[224]

6.44 We have considered whether the factors listed in paragraphs 6.38.1 to 6.38.5 above potentially support using a WACC estimate closer to our lower bound of the 60th percentile. However, in our view some conservatism in selecting the percentile remains appropriate, particularly given that there is fundamental uncertainty regarding the appropriate WACC percentile, and the long-term costs to consumers of under- and over-estimating WACC are asymmetric (so erring on the higher side is likely to be in consumers' interests).

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221 Economic Insights Pty Ltd "Regulatory Precedents for Setting the WACC within a Range" (16 June 2014), page 22.

222 As noted in paragraph 4.9 above, submissions acknowledge that judgement is required when determining the WACC percentile.

223 We note that use of the 75th percentile results in a significant uplift to WACC, and therefore prices to consumers. However, the incremental benefits to consumers from using the 75th percentile over a modestly lower percentile are not clear.

224 As noted in paragraph 5.39, the majority of these expert reports where submitted on behalf of regulated suppliers, rather than consumers.

Our draft decision applies to EDBs, Transpower and GPBs

6.45 As noted by Oxera, one of the themes raised in the expert submissions we have received is that risks and incentives to invest differ on a sector-by-sector basis. Oxera noted that it may be helpful to supplement the energy market analysis that has been conducted with examples from other industries, when considering whether the WACC percentile for energy businesses should be applied across other sectors.[225]

6.46 Our draft decision to reduce the WACC from the 75th to the 67th percentile estimate applies to energy businesses (EDBs, Transpower and GPBs). However, as discussed in paragraph 1.27 above, we are taking additional time to consider the WACC percentile for airports, because we have not yet fully considered the airport-specific aspects of submissions at this stage (for example, the role of using a dual-till approach to regulation).

6.47 We considered the specific points raised regarding Transpower when deciding to apply the same percentile to both EDBs and Transpower. In particular, we considered the significance of pre-approval of capex, which provides a check against potential over-investment.[226] However, in our view the differences between EDBs and Transpower do not justify a different WACC percentile.

6.47.1 To date, the allowed cost of an approved major capex project is the minimum of the actual spend and the P90 of the forecast capex amount, meaning that in some circumstances there will be the ability for a larger investment value to enter the RAB than is required to efficiently deliver the project (in addition to the impact of a higher WACC percentile on prices).

6.47.2 Much of Transpower's investment may be required to meet reliability targets, and this investment may be made even without an uplift to WACC.[227] On the other hand, other types of investment (for example, investment to improve technology or reduce losses) may be induced through an uplift, but potentially at a cost which is high relative to the benefits. This is discussed further in Attachment C.

6.48 Further, while we accept that there are differences between electricity lines and gas pipelines; we consider these industries to be similar enough for the same WACC percentile to apply.

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225 Oxera "Oxera review of submissions: the appropriate WACC percentile" (17 July 2014), page 2.

226 Frontier Economics Pty Ltd “Evidence on the WACC percentile: A Report prepared for Transpower in response to the Commerce Commission consultation” (report prepared for Transpower New Zealand Ltd, May 2014), pp.17-18.

227 Quality targets are discussed generally in paragraphs 3.23 and 4.20-4.21 above.

6.49 In reaching the draft view that the same WACC percentile should be applied to EDBs, Transpower and GPBs, we note that Dr Lally considered whether different percentiles should be applied to different sectors. He concluded that "…the difficulties in estimating these differential rates preclude this course of action".[228] However, Dr Lally noted that the one exception would where the appropriate margin is considered to be much lower than normal (he referred to dual-till operations as a possible example of this).

6.50 Similarly, Professor Vogelsang noted that there may be a case for a tailored approach for different industries. In particular, he stated that gas, airports and telecommunications may differ enough to justify different WACC percentiles.[229]

6.51 However, Professor Vogelsang also explained that even if analysis of these sectors discovers major differences, and suggests a different outcome for different industries, we may still decide against a case-by-case approach. Specifically, he stated:[230]

> There exist many policies in other areas, where different cases are treated the same, because that saves difficult and time-consuming analyses and generates more predictable results.

6.52 Although our draft decision is that the same WACC percentile should be used for EDBs, Transpower and GPBs, we are open to submissions, supported by evidence, regarding whether different WACC percentiles should be applied to these sectors.

Reasonableness checks of the 67th percentile WACC percentile estimate

6.53 We have updated the reasonableness checks used in 2010 to see whether our 67th percentile WACC estimate is within the reasonable range of cost of capital estimates from independent analysts.[231] The reasonableness checks we have conducted are described in detail in Attachment B.

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228 Dr Martin Lally "The appropriate percentile for the WACC estimate" (19 June 2014), page 3.

229 Professor Ingo Vogelsang "Review of Oxera's Report, Input methodologies - Review of the '75th percentile' approach" (10 July 2014), pages 5-6, paragraph 9.

230 Professor Ingo Vogelsang "Review of Oxera's Report, Input methodologies - Review of the '75th percentile' approach" (10 July 2014), page 6, paragraph 9.

231 Commerce Commission "Input Methodologies (Electricity Distribution and Gas Pipeline Services): Reasons Paper" (December 2010), pages 578 to 603, paragraphs H13.1 to H13.106.

6.54 When undertaking the reasonableness checks, greatest weight has been given to:

6.54.1 New Zealand sourced WACC estimates; and

6.54.2 WACC estimates for businesses which are closest to pure-play providers of regulated electricity lines services (for example, Transpower).[232]

6.55 We have also standardised all WACC estimates using the risk-free rate we estimated under the IMs as at 1 April 2014.[233] This is necessary because the cost of capital IMs use a spot risk-free rate, but some analysts use long-term averages. The purpose of the reasonableness checks is not to highlight differences in the risk-free rates which are used by different analysts.

6.56 Using the 67th percentile results in a WACC estimate for EDBs and Transpower that is:[234]

6.56.1 within the range of independent broker WACC estimates for Transpower provided by Northington Partners, Forsyth Barr and First NZ Capital;

6.56.2 above the PwC WACC estimates for Vector and Horizon; and

6.56.3 close to broker WACC estimates for Vector's entire business, even though a significant proportion of Vector's activities are higher risk than its regulated electricity distribution business (such as gas pipelines, for which we allow a higher WACC).

6.57 In conclusion, the available comparator information indicates that moving from the 75th to the 67th percentile will not result in a WACC estimate that is out of line with independent estimates of the WACC for electricity lines and gas pipeline services in New Zealand.

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232 Other (unregulated) businesses are generally likely to have a higher cost of capital than regulated businesses. Although both Transpower and Horizon have unregulated businesses, these are proportionately small relative to other comparators (such as Vector).

233 *Cost of capital determination for information disclosure year 2015 for specified airport services (March year-end) and electricity distribution services* [2014] NZCC 10. As at 1 April 2014, the risk-free rate for a five year term was 4.21%.

234 As noted in paragraphs B20 to B21 below, based on the available evidence, we conclude that moving from the 75th to the 67th percentile will also result in commercially realistic WACC estimates for GPBs.

Impact of using the 67th percentile WACC estimate instead of the 75th percentile

6.58 Across energy businesses subject to price-quality path regulation under Part 4 (excluding Orion), we estimate that reducing the WACC from the 75th to the 67th percentile would lead to a reduction in payments by consumers of approximately $32.8 million per annum.[235]

6.59 The estimate of $32.8 million per annum is based on the following assumptions.[236]

6.59.1 The combined RAB for EDBs subject to default price-quality path regulation and Transpower is approximately $11.3 billion, and the combined RAB for all GPBs is approximately $1.6 billion.[237]

6.59.2 For EDBs and Transpower, using the 67th percentile instead of the 75th percentile reduces the WACC by 25 basis points.[238] The 75th percentile corresponds to an uplift from the mid-point WACC estimate of 72 basis points and the 67th percentile corresponds to an uplift of 47 basis points.

6.59.3 For GPBs, using the 67th percentile instead of the 75th percentile reduces the WACC by 28 basis points. The 75th percentile corresponds to an uplift from the mid-point WACC estimate of 81 basis points and the 67th percentile corresponds to an uplift of 53 basis points.

A range from the 33rd to 67th percentile is appropriate for information disclosure regulation

6.60 Under the cost of capital IMs, a WACC range is used for information disclosure regulation. The current range is symmetric around the mid-point WACC estimate, and is bounded by the 25th and 75th percentile WACC estimates.

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235 We note that regulated suppliers' revenues would also reduce by $32.8 million per annum, unless consumption increases.

236 The estimate of $32.8 million per annum is comprised of $16.7 million for EDBs subject to DPP regulation, $11.6 million for Transpower, and $4.5 million for GPBs. We note that any changes to the WACC percentile for GPBs would not take effect until the next default price-quality path reset in 2017 (unless there is a customised price-quality path set prior to then). Orion is currently on a CPP which will not end until 2019. Note that these estimates understate the reduction in consumer payments and supplier revenues due to reducing the WACC from the 75th to the 67th percentile, because they have been calculated on a post-tax basis. Because revenues are pre-tax amounts, more accurate estimates of the reduction would be grossed up for the tax effect.

237 The RAB values for EDBs and GPBs are based on 2013 disclosures. We have used Transpower's forecast opening RAB for RCP2 of $4.64 billion. Transpower "2015/16 to 2019/20 Transmission Revenue" (9 December 2013), page 1.

238 As an example of the impact on the overall WACC, using the 67th percentile instead of the 75th percentile reduces the post-tax WACC for EDBs as at 1 April 2014 by 3.7% (from 6.82% to 6.57%). The corresponding reduction in the vanilla WACC is 3.2% (from 7.60% to 7.36%). The 75th percentile WACC estimates for EDBs as at 1 April 2014 are available in *Cost of capital determination for information disclosure year 2015 for specified airport services (March year-end) and electricity distribution services* [2014] NZCC 10.

6.61 In the IMs we noted that the appropriate WACC range is a matter of judgement. When deciding to use a range from the 25th to 75th percentile for information disclosure regulation, we stated:[239]

> 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.
>
> 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.

6.62 Our view remains that the WACC range for information disclosure regulation should be symmetric around the mid-point. Consistent with the reduction in the WACC percentile for price-quality path regulation, we consider that the WACC range for information disclosure for energy businesses should be from the 33rd to the 67th percentile.

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239 Commerce Commission "Input Methodologies (Electricity Distribution and Gas Pipeline Services): Reasons paper" (December 2010), pages 569-570, paragraphs H11.59-H11.60.

Attachment A: Analysis of RAB multiples

Purpose of this attachment

A1 This attachment:

A1.1 discusses information on recent transactions involving shares in regulated suppliers and how they support our view that use of the 75th percentile of WACC to set prices is too generous;

A1.2 explains why we are not persuaded that other factors identified in submissions can adequately explain the price, relative to RAB, in these transactions.

What are RAB multiples?

A2 The RAB multiple of a regulated business is the ratio of its enterprise value to its RAB. It provides a useful indicator of whether the regulatory rate of return has been set a level which is sufficient to adequately compensate investors for putting their capital at risk.

A3 Broadly, the formula used in assessing the RAB multiple is as follows, where the enterprise value is calculated as the sum of the market value of net debt and the market value of the shareholders equity:

$$RAB\ Multiple = \frac{Enterprise\ Value\ of\ Regulated\ Entity}{Regulatory\ Asset\ Base}$$

A4 At its simplest, in the absence of other factors, a company will deliver returns close to its 'true' cost of capital (ie, the RAB multiple should track 1.0). That is, the net present value (NPV) of expected net cash flows should, if the regulator's assumptions hold, equal the value of the RAB.

A5 In an incentive-based regulatory regime, the RAB multiple will not only reflect the relationship between the regulatory allowed rate of return and the market WACC, but also the market's expectations of the company to over or under-perform the regulator's cash-flow and other model assumptions. On this basis, a RAB multiple of greater than 1.0 could imply either the regulatory allowed rate of return was too high or the market expected the company to out-perform cash-flow or other model assumptions used in their regulatory determination (or a combination of both).

New Zealand evidence of RAB multiples

A6 There is available New Zealand evidence which allows us to estimate RAB multiples for regulated EDBs/GPBs.

A6.1 In July 2013 AMP Capital Investors announced the acquisition of a 42% stake in Powerco Ltd for $525 million.

A6.2 Both Vector and Horizon Electricity Ltd are publicly listed companies, so the share price provides an estimate of the market value of equity of these companies. Estimates of the value of debt and the RAB are also readily available for these companies.

AMP's purchase of a stake in Powerco implies a 33% premium to RAB

A7 The price paid by AMP for its 42% equity stake in Powerco implies a value of $1,250 million for 100% of Powerco's equity (assuming no premium for control). Powerco had net debt of $1,078 million as at March 2013, implying an enterprise value of $2,328 million.[240]

A8 As of March 2013, Powerco had a RAB of $1,408 million for its electricity distribution business, and $347 million for its gas pipeline business.

A9 This implies a RAB multiple for Powerco of 1.33x (ie, a premium of more than 30% to RAB). The calculation of this RAB multiple is shown below:

$$RAB\ Multiple = \frac{(\$1{,}250\text{m} + \$1{,}078\text{m})}{(\$1{,}408\text{m} + \$347\text{m})} = 1.33x$$

A10 The analysis of Powerco's RAB multiple:

A10.1 Makes no allowance for Powerco's unregulated assets, such as Powerco Transmission Services, which are assumed to be immaterial to this analysis. Powerco's accounts show that the revenue and net income from Powerco Transmission Services represents just 0.7% of Powerco's total revenue, and 1.1% of total operating profit, respectively.[241]

A10.2 Assumes no major transactions have occurred between Powerco's balance date (when the value of net debt and the RAB is estimated) and the date of AMP's acquisition (when the value of equity is estimated).

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[240] Net debt calculated as total debt (short and long term) less cash. Data was sourced from Powerco Annual report 2013, page 31.

[241] Powerco Annual Report 2013, note 24, page 66.

A10.3 Makes no allowance for the value of financial derivatives contracts in respect of Powerco's debt obligations. These alter the company's total debt obligations, and the value of company's equity, and so it can be argued these should be included in Powerco's enterprise value. At March 2013 Powerco had $145m of such obligations.[242] Including these in the calculation would increase the multiple by around 0.08x.

A10.4 Makes no allowance for capital expenditure which has been incurred, but in respect of assets which have not yet been commissioned (and are therefore not yet part of the RAB). As at March 2013, Powerco reported work in progress of $43.7 million. Including these in the calculation at that value would reduce the multiple by around 0.03x.

A11 In our view the premium of over 30% to Powerco's RAB is significant as:

A11.1 AMP Capital Investors acquired only a minority stake in Powerco (of 42%; QIC holds 58%), and thus the pricing is unlikely to be significantly affected by assumed synergies or control premiums;

A11.2 AMP Capital Investors is an essentially passive financial investor, without other operations in this sector in New Zealand, limiting potential synergies;

A11.3 expert advice to a UK regulator suggested it was highly unlikely outperformance on incentives and cost would contribute any more than 10% of a premium to RAB, and that a larger premium indicated a mispricing of the regulated rate of return;[243] and

A11.4 we have seen no evidence to suggest a premium of anything nearing 10% is warranted for Powerco's outperformance of its current price-quality path (and which expires in 2015).

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242 These were disclosed as "other financial liabilities". Powerco Annual Report 2013, pages 31, 55-57. Note that the value of these contract obligations varies over time.

243 Cambridge Economic Policy Associates (2013), “ORR - Advice on Estimating Network Rail’s Cost of Capital”, Final Report, June 2013.

Vector trades at a premium to RAB

A12 We have also sought to estimate the RAB multiple for Vector and Horizon Electricity Limited.

A13 Analysis of the RAB multiple for Vector is complicated by its ownership of significant non-regulated businesses. Vector's unregulated businesses account for 36% of its total revenues in 2013/14.[244]

A14 For the purpose of this analysis we have attributed values for the unregulated businesses based on a sum-of-the-parts valuation of Vector's businesses, published by Deutsche Bank in February 2014.[245] Deutsche Bank valued Vector's:

A14.1 electricity lines business at $2,886 million;

A14.2 "gas transmission" business (which includes gas distribution) at $1,113 million;

A14.3 gas trading business at $515 million, and

A14.4 technology/other business at $542 million.

A15 Estimates of Vector's net debt are available as at June 2013 and December 2013.

A16 Further, the value of Vector's RAB was:

A16.1 $2,536 million for electricity distribution as at March 2013;

A16.2 $468 million for gas distribution as at June 2013; and

A16.3 $498 million for gas transmission as at June 2013.

A17 Since Vector's RAB is growing, we have allowed for forecast growth in the RAB to reflect forecast capex and historic depreciation based on disclosed regulatory statements.

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[244] Vector annual report 2013, page 22; EDB Information Disclosure Requirements Information Templates (2013), Schedule 3; GDB Information Disclosure Requirements Information Templates (2013), Schedule 3; GTB Information Disclosure Requirements Information Templates (2013), Schedule 3.

[245] Deutsche Bank, "Vector - Cuts being Treated" (21 Feb 2014), page 6.

A18 Table A1 below estimates the RAB multiples for Vector, based on:

A18.1 Deutsche Bank's valuation of the regulated businesses; and

A18.2 the average share price for the 20 trading days prior

A18.2.1 to 30 June 2013 ($2.78) being the last day of Vector's 2012/13 financial year; and

A18.2.2 to 10 December 2014 ($2.59), being the day before the merits review judgment was released.[246]

Table A1: Estimated RAB multiples for Vector's regulated business

	June 2013	December 2013
Based on Deutsche Bank's valuation of the regulated businesses, and RAB as at June and December 2013	1.13x	1.11x
Based on the 20 day average share price, the book value of debt, and RAB as at June and December 2013, and the Deutsche Bank valuation of the unregulated businesses	1.16x	1.09x

A19 This analysis shows Vector trading at a multiple of between 1.09x and 1.16x RAB. This is less than the multiple for Powerco, but is still a significant premium to RAB.[247] This too is prima facie evidence that our estimate of allowed WACC based on the 75th percentile is too generous, particularly as the current EDB price-quality path, which has over 70% of Vector's aggregate RAB) will be reset from April 2015, with the GPB paths reset in 2017.[248]

246 The observed share price for Vector from 11 December 2013 will be affected by the release of the Court's judgment questioning the appropriateness of the 75th percentile. That is, the share price will likely be discounting a re-consideration of the appropriate percentile.

247 The reasons for the difference in premiums between Vector and Powerco are not readily apparent, but could relate to potential tax structuring. The potential for tax structuring to impact on the premium is noted by PwC for Vector (PricewaterhouseCoopers "Rationale for transaction premiums to RAB value" (report prepared for Vector Limited, 28 March 2014)) and at paragraph A29 below.

248 When a price-quality path is re-set it will reflect achieved efficiency gains, so achieved gains will accrue to consumers in future regulatory periods (subject to the impact of IRIS). However, to the extent that investors expect a supplier to make further efficiency gains in future pricing periods, they may be prepared to pay a larger premium to RAB.

Horizon

A20 In addition, we have looked at Horizon Energy, which is also listed. It has an enterprise value of around $110 million, a RAB as at March 2013 of $104 million and owns two significant unregulated businesses as well as its electricity distribution business.[249] It seems likely that Horizon is trading at an implied discount to RAB. However, we place little weight on this evidence because:

A20.1 there is very low liquidity in Horizon's shares (and no broker research coverage) which likely impairs the price discovery function of the market;[250]

A20.2 Horizon is a small company relative to Powerco and Vector. The latter together represent 40.7% of total EDB RAB in New Zealand, while Horizon comprises approximately 1%;

A20.3 we consider that prices paid by consumers for regulated services should not include a premium if smaller companies choose to remain inefficiently small;[251] and

A20.4 it is difficult to place a reliable value on Horizon's unregulated businesses since there are no independent valuations (eg, broker estimates) for those businesses, and they have generally been owned for only a limited time by the Horizon resulting in a short track record of performance.[252]

Transpower

A21 In its valuation of Transpower for the Crown, Northington Partners (Northington) noted that Transpower was valued at a premium to its book value and that this was higher than most of the comparator evidence. Northington stated that "…is a direct consequence of our assumption regarding the relativities between the regulated WACC and current required returns".[253] Northington's required rate of return estimate was lower than the current regulatory WACC for RCP1 and its estimate of the regulatory WACC for RCP2.[254]

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249 Revenues from unregulated services were 55% of Horizon's total revenues in 2013/14. Horizon Energy Distribution Annual Report 2014, page 17; Horizon EDB Information Disclosure Requirements Information Templates (2013), Schedule 3.

250 In the first six months of calendar year 2014, just 14,000 Horizon shares have traded, with a total value of less than $50,000.

251 Commerce Commission, “Input Methodologies (Electricity Distribution and Gas Pipeline Services), Reasons Paper", (Dec 2010), paragraph 6.4.29.

252 They were profitable in 2014, but lost money in 2013. Horizon Annual Reports 2013 and 2014.

253 Northington Partners, "Transpower New Zealand Limited Valuation Assessment", 15 Nov 2013, page 6.

254 Northington Partners, "Transpower New Zealand Limited Valuation Assessment", 15 Nov 2013, page 5.

The premium to equity holders if WACC is too high

A22 The analysis above compares the enterprise value of the firm to the RAB, to provide insight into whether the WACC is appropriately specified. An alternate approach is to focus solely on the position of equity holders. Such an approach recognises:

A22.1 that the cost of debt can be estimated more easily, and with more precision, than the cost of equity can (so the uplift to WACC relates almost entirely to the cost of equity); and

A22.2 it is the equity investors that are ultimately exposed to fluctuations in the value of the business, including if WACC is over- or under-estimated.

A23 Powerco had a RAB of $1,755 million across its regulated services and net debt of $1,078 million as at March 2013. Equity holders financed the balance of the RAB, that is $677 million (ignoring the value of any unregulated assets owned). The price paid by AMP for 42% of Powerco implies a total value of equity of $1,250 million. That is, AMP's acquisition places a value on Powerco's equity which is 84% greater than the amount of equity required to finance the RAB.

A24 For Vector, the comparable percentage is around 19% using data as at December 2013.[255]

Why we are sceptical other factors can explain the Powerco RAB multiple

A25 PwC (on behalf of Vector) and Frontier Economics (on behalf of Transpower) identified a number of reasons why premiums to RAB may exist.[256] These submissions do not attempt to quantify these factors or demonstrate that the factors they identify have a material impact on the RAB multiple for Powerco.

A26 We accept there are a number of factors which can in theory explain why a regulated supplier may be at valued at a premium to RAB. However, with regard to the particular characteristics of Powerco, we are not persuaded that any of those factors - apart from that the regulated WACC is too high - can adequately explain why Powerco was acquired at such a significant premium to RAB.

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255 Taking estimated RAB of $3,610 million across its three regulated services and taking 79% of net debt (as per Deutsche Bank's apportionment of value between the regulated (79%) and unregulated businesses (21%)) as at December 2013. So equity holders financed the balance of the RAB, that is $1,717 million. At a December 2013 20 trading day average share price of $2.59, the implied total value of equity in the regulated businesses (again using Deutsche Bank's apportionment of value between the regulated (79%) and unregulated businesses (21%)) is $2,044 million. The listed share price represents a 19% premium to the book value of equity in the regulated business.

256 PricewaterhouseCoopers “Rationale for transaction premiums to RAB value” (report prepared for Vector Limited, 28 March 2014). Frontier Economics Pty Ltd “Evidence on the WACC percentile: A Report prepared for Transpower in response to the Commerce Commission consultation” (report prepared for Transpower New Zealand Ltd, May 2014).

A26.1 AMP Capital Investors has acquired only a minority (42%) stake in Powerco (and its fellow shareholder holds 58%), and is a passive financial investor which does not have existing network management resources or skills to bring to Powerco. This would seem to limit the extent to which it can:

A26.1.1 realise tax advantages specific to Powerco; and

A26.1.2 realise material operating synergies of the kind that that could accrue to an EDB (GPB) purchasing all of another EDB (GPB).

A26.2 The enterprise value implied by AMP's share purchase exceeds Powerco's RAB by around $570 million (ie, 33%).

A26.3 Whatever the precise cause of the premium to RAB, the existence of a premium suggests there is an incentive to invest.

Specific responses to points raised by PwC and Frontier Economics regarding RAB multiples

A27 PwC submit that international investors may pay premiums when investing in New Zealand and refers to:[257]

A27.1 the ability to borrow more cheaply internationally than our IM assumes; and

A27.2 tax structuring opportunities, such as the double deduction of interest.

A28 In respect of the relative cost of raising debt internationally, we note:

A28.1 some regulated suppliers do access international debt markets, and the cost of debt advantage available overseas;[258]

A28.2 raising debt in offshore markets creates an exposure to exchange rate risks since the RAB and maximum prices are stated in New Zealand dollars; and

A28.3 if capital can be raised internationally at lesser cost than our IM assumes, then this could reduce the extent of the uplift above our mid-point WACC that is required to ensure investment occurs. (Ie, part of the buffer to ensure the WACC is high enough to attract investment is provided indirectly through lower cost offshore borrowing, so less needs to be provided through an explicit uplift above the mid-point WACC).

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257 PricewaterhouseCoopers "Rationale for transaction premiums to RAB value" (report prepared for Vector Limited, 28 March 2014), pages 3-4 (point I and ii).

258 See our discussion on suppliers raising debt offshore in our IM Reasons paper, at paragraphs H5.102-H5.108.

A29 In respect of the potential double claiming of interest, we note:

A29.1 our IM assumes interest expense can be deducted only once;

A29.2 if some investors are double-deducting interest, then investment in New Zealand's regulated suppliers may appear relatively attractive to such investors, regardless of any uplift to our mid-point WACC;

A29.3 if some investors are double-deducting interest, the need for an uplift to the WACC is reduced, at least in respect of international investors;

A29.4 there is no evidence that any potential tax structuring benefits are unique to the special circumstances of Powerco; and

A29.5 in any event, Vector also trades at a premium to RAB (based on a New Zealand listed share price and, we assume, presumably domestically based investors).

A30 We discussed the cost of capital for international investors in our IM reasons paper in 2010, where we observed that:[259]

A30.1 our IM uses the simplified Brennan-Lally CAPM which is a domestic CAPM that does not consider the perspective of international investors;

A30.2 the use of a domestic CAPM may over-estimate the cost of capital for international investors;[260]

A30.3 international investors can be viewed as the key marginal investors; and

A30.4 these were relevant considerations in choosing the appropriate WACC percentile to use when setting price-quality paths.

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259 Commerce Commission, "Input Methodologies (Electricity Distribution and Gas Pipeline Services), Reasons Paper", (Dec 2010), paragraph H11.54.

260 Note that if a mid-point estimate of WACC from the point of view of an international investor is lower than our IM estimate of mid-point WACC, then any (positive) uplift to our estimate WACC will still result in over-estimates of the cost of capital for international investors.

A31 In addition, PwC submits that historic returns in another market or jurisdiction could lead investors to perceive that similar returns could be achieved in NZ regulated sectors.[261] We note:

A31.1 PwC provided no evidence that the impact of any such perceptions would be material; and

A31.2 perceptions based on international precedent seem to be much less relevant or significant when the local regulator has established clear precedents on, among other things, how WACC will be set, how assets will be valued, and how prices will be set, for that sector.

A32 PwC submits that investors seeking to balance their portfolios could lead to asset purchases occurring at a premium.[262] We note that portfolio balancing is, if anything, more likely to lead investors to buy at a discount. Ie, a desire to rebalance may move money from areas which have outperformed to areas which have underperformed (and thus may be able to be bought at a discount).

A33 PwC and Frontier submit that the premium could be attributable to the value and growth potential of Powerco's unregulated businesses, or to intangible assets.[263] As an example, Frontier refers to Powerco Transmission Services. However:

A33.1 neither of those submissions offer any evidence on the value of Powerco's unregulated businesses and their growth prospects, nor on whether these could explain the high RAB multiple implied by AMP's investment;

A33.2 no evidence has been offered on the significance or value of any intangible assets owned by Powerco. We are not aware that the value is material, based on publicly-available information;

A33.3 as discussed above, based on Powerco's annual accounts, Powerco Transmission Services is a relatively small business, and therefore would seem to have only limited value;[264]

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261 PricewaterhouseCoopers "Rationale for transaction premiums to RAB value" (report prepared for Vector Limited, 28 March 2014), page 5 (point vi).

262 PricewaterhouseCoopers "Rationale for transaction premiums to RAB value" (report prepared for Vector Limited, 28 March 2014), page 4 (point iv).

263 Frontier Economics Pty Ltd "Evidence on the WACC percentile: A Report prepared for Transpower in response to the Commerce Commission consultation" (report prepared for Transpower New Zealand Ltd, May 2014), page 10, second and third bullet points. PwC, Rationale for transaction premiums to RAB value, 28 March 2014, page 5 (point vii)

264 Refer to paragraph A10.1 of this report.

A33.4 Powerco's revenue from segments other than electricity, gas and transmission were 0.5% ($2.2 million) of its total revenue in the year to March 2014.[265] The value of any intangible assets which are primarily generating unregulated revenues would seem to be immaterial.

A34 PwC and Frontier Economics submit that the large premium paid for Powerco could be evidence of the "winner's curse", or an "investment imperative".[266] However, no evidence has been offered that other bidders submitted materially lower bids for the stake in Powerco such that, if another bidder had been successful, the price paid relative to RAB would have been materially different. Further, as the "investment imperative" described by PwC is generic in nature, rather than being specific to the investor in Powerco, it could be a factor in other transactions also.

A35 PwC submits that the premium may be due to AMP seeing Powerco as a beachhead for expansion into the electricity lines / gas pipelines sectors.[267] We are aware that AMP has stated it would like Powerco to grow, and including by acquisition.[268] However it is not evident why AMP would therefore pay a 30%+ premium to RAB to acquire its part stake in Powerco, unless the WACC we allow when setting prices appears relatively generous, given:

A35.1 the limited number of recent transactions in this sector;

A35.2 the large number of relatively small suppliers in the electricity distribution sector (which may increase acquisition and integration costs); and

A35.3 the strong interest in investing in the sector implying that AMP/Powerco could face multiple strong competing acquirers in any future acquisition (and with those bidders potentially motivated by the same considerations which PwC has identified as justifying payment of a large premium to RAB by AMP).

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265 Powerco, Annual Report, 2014, note 23, page 65.

266 See PricewaterhouseCoopers “Rationale for transaction premiums to RAB value” (report prepared for Vector Limited, 28 March 2014), page 11.

267 See PricewaterhouseCoopers “Rationale for transaction premiums to RAB value” (report prepared for Vector Limited, 28 March 2014), page 4 (point v).

268 Acquisition International, "Power Grab - AMP Capital’s Acquisition of Powerco Stake", (October 2013), at page 9.

A36 Frontier Economics submits that:[269]

A36.1 Powerco has gas pipeline businesses as well as an electricity lines business, and that the GPB may have higher risk, and a higher WACC, than the GPB; and

A36.2 as a result, a diversified business like Powerco may have a higher than a pure-play EDB.

A37 We note that if the regulator did not allow a higher return for the gas business, (ie, it allowed the same WACC for both businesses, based on the risks of the EDB), then this would suggest that the consolidated business should trade at a discount to RAB, not a premium. In practice, we do recognise the greater risks of supplying gas, and allow a higher WACC for supplying gas than for electricity.[270] However, the size of the premium over RAB for Powerco implies that one or both of these allowed WACCs is relatively generous.

A38 Frontier Economics submits that the acquirer may have expected Powerco to generate greater efficiencies than we assumed, and reference our assumption of an assumed rate of change in partial productivity of zero in the 2012 DPP reset. [271] In response we note that since prices are reset every five years, any such gains are not retained for more than five years.[272] Frontier Economics does not identify whether Powerco is achieving greater efficiency or, more fundamentally, how large such gains would need to be to explain even a significant portion of a 30% premium to RAB.

A39 In summary, it is our view that the strongest and clearest conclusion from the RAB multiple observed for Powerco is that our use of the 75th percentile estimate of WACC to set price-quality paths is producing estimates of the cost of capital that are greater than necessary to attract capital.

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269 Frontier Economics Pty Ltd "Evidence on the WACC percentile: A Report prepared for Transpower in response to the Commerce Commission consultation" (report prepared for Transpower New Zealand Ltd, May 2014), page 10-11, fourth bullet point.

270 This occurs as we specify both a higher asset beta for gas pipeline businesses, and a higher standard error of the asset beta. Commerce Commission "Input methodologies (Electricity Distribution and Gas Pipeline Services): Reasons Paper" (December 2010), paragraphs H8.167-H8.182, and H8.206. The resulting midpoint WACC for gas pipeline businesses is 0.71% higher than the midpoint for an EDB given the same assumptions about the risk-free rate and debt premium.

271 Frontier Economics Pty Ltd "Evidence on the WACC percentile: A Report prepared for Transpower in response to the Commerce Commission consultation" (report prepared for Transpower New Zealand Ltd, May 2014).

272 We acknowledge that the price investors pay may reflect the expectation that a supplier can make efficiency gains in future regulatory periods.

A40 Frontier Economics notes, and we acknowledge, that the multiple paid in respect of Powerco is a single observation only. However, it is evidence of how investors assess the returns from investment in the sector, the premium was large for a minority stake, and Vector too trades at a significant premium to RAB.

Attachment B: Reasonableness tests

Purpose of reasonableness tests

B1 In our February 2014 consultation paper we indicated we would undertake reasonableness tests on our estimates of the cost of capital.[273] We also undertook reasonableness tests when we finalised the cost of capital IM in 2010.[274]

B2 The purpose of the 2010 reasonableness tests was to check that application of the overall IMs produced commercially realistic estimates of the cost of capital. The reasonableness testing had the potential to identify any oddity in the Commission's estimates requiring us to modify our IMs.[275]

B3 The purpose of the reasonableness tests in the current context is similar, but the scope now is more limited. We use the reasonableness tests to ensure that adopting the 67th percentile of WACC will not move our overall estimate of WACC which will be used for setting price-quality paths, outside of the realistic range of estimates of the cost of capital for businesses of comparable risk.

Comparative information considered when conducting reasonableness tests

B4 The comparative information we have considered is very similar to that used in 2010, and comprises updated publicly-available information on:

B4.1 yields on five-year Government stock and BBB+ corporate debt;[276]

B4.2 estimates of the long-run historical returns earned by New Zealand investors on investments of average risk (over the period 1900-2012);[277]

B4.3 estimates of future returns expected by New Zealand investors on investments of average risk;[278] and

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273 Commerce Commission "Invitation to have your say on whether the Commerce Commission should review or amend the cost of capital input methodologies" (20 February 2014), page 13, paragraph 36.

274 Commerce Commission, "Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper", December 2010, Attachment H13.

275 Commerce Commission, "Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper", December 2010, paragraph H13.1.

276 Cost of capital determination for information disclosure year 2015 for specified airport services (March year-end) and electricity distribution services [2014] NZCC 10, at page 5.

277 Credit Suisse Global Investment Returns Sourcebook (2013), page 135.

278 Ie, using our Cost of Capital IM (Electricity Distribution Services Input Methodologies Determination 2012) and assuming an asset beta of one.

B4.4 independent estimates of the post-tax WACC for New Zealand monopolies from:

B4.4.1 Forsyth Barr;[279]

B4.4.2 First NZ Capital;[280]

B4.4.3 Northington Partners;[281]

B4.4.4 PwC;[282] and

B4.4.5 research analysts employed by major investment banks. [283]

B5 In all cases we compare our post-tax WACC estimate as the comparative information is generally only available on a post-tax basis only. All references to WACC in this attachment should be read as references to post-tax WACC.

Standardisation of estimates to a single risk-free rate

B6 The IMs use estimates of the risk-free rate and debt premium prevailing at the time the WACC is being estimated. Some analysts more typically use (differing) long-run average estimates for these parameters.[284]

B7 As a result, our estimate will be more volatile than the estimate of some analysts and lower (above) those other estimates depending on whether the prevailing spot risk-free rate and debt premia, is below (above) the long-term average. Over time, these differences would be expected to offset somewhat: sometimes we would use estimates that are below the long-term average, and sometimes above it.[285]

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279 Forsyth Barr, “Transpower - Capex Coming to Fruition", (8 Nov 2011).

280 First NZ Capital, "Transpower - A Valuation Perspective", (31 Oct 2011).

281 Northington Partners, "Transpower New Zealand Limited Valuation Assessment", (15 Nov 2013).

282 PwC, "Appreciating Value", 5th Edition, (June 2014), page 21.

283 Goldman Sachs JBWere, Deutsche Bank, Forsyth Barr, First NZ Capital, UBS were all contacted by phone in mid-June 2014 and surveyed as to their WACC estimates for Vector, and the risk-free rates that were used in their analysis.

284 We also allow for the greater debt premium (and related costs) of issuing debt with a term greater than five years, through the Term Credit Spread Differential as an addition to cash flows for qualifying suppliers.

285 Some analysts use averages of the 10 year risk-free rate, where we use the 5 year risk-free rate. This difference in term may lead to differences, over time, between our estimates and long-term averages. Our reasons for preferring a 5 year term (to match the regulatory period) were explained in the IM reasons paper, and are beyond the scope of the current consultation.

B8 To standardise for the difference between spot risk-free rates and long-term averages of the risk-free rate we have adjusted all other estimates to reflect the same risk-free rate as used for our estimate.[286] This recognises that the use of the reasonableness tests is to assess our decision to move from use of the 75th percentile to the 67th percentile of the WACC distribution, and is not to highlight differences in the risk-free rates which are used by different analysts. The approach to estimating the risk-free rate is outside the scope of this consultation.

B9 Specifically, our standardisation takes the independent estimate of WACC and adjusts it for the difference between the risk-free rate we use, and the risk-free rate used by independent analysts, less the impact of tax. We have used data in March 2014, to correspond with our most recent determination of WACC for the electricity lines businesses.[287] The effect of this standardisation is illustrated in Table B1 below.

Table B1: The impact of standardising for differences in risk-free rates

Analyst	Original WACC estimate	Risk-free rate used	Standardisation adjustment	Standardised WACC estimate
Northington Partners (Transpower)	7.00%	4.75%	-0.39%	6.61%
Forsyth Barr (Transpower)	7.24%	6.00%	-1.29%	5.95%
First NZ Capital (Transpower)	7.60%	5.20%	-0.71%	6.89%
PwC (Vector)	6.60%	5.00%	-0.57%	6.03%
PwC (Horizon)	6.90%	5.00%	-0.57%	6.33%
Broker estimates (Vector)	7.0% to 8.1%	4.5% to 6.0%	-0.2% to -1.3%	6.4% to 7.2%

[286] We have not standardised the estimates of WACC for differences in the debt premium. The amounts involved are significantly smaller and have a limited effect on the analysis.

[287] Cost of capital determination for information disclosure year 2015 for specified airport services (March year-end) and electricity distribution services [2014] NZCC 10.

Interpretation of the comparative information

B10 In considering the comparative information on WACC, it is our view that greatest weight should be given to NZ sourced estimates and to estimates relating to businesses which are closest to pure-play providers of regulated services (particularly Transpower, as this is the closest comparator to a pure-play regulated electricity lines business).[288]

B11 As before, the yields on BBB+ corporate debt is used as the extreme lower end, and the expected and historic returns to NZ investors as the extreme upper end, of the plausible range of the cost of capital for a provider of electricity lines services.

Assessment of reasonableness of the mid-point WACC

B12 Using the standardised risk-free rates, we note our estimate of the mid-point WACC for an EDB of 6.10% is:

B12.1 within the range of the independent broker estimates of the WACC for Transpower:

B12.1.1 Forsyth Barr use 5.95%;

B12.1.2 Northington Partners use 6.61% (including a 15% premium on the cost of equity which has no counterpart in other independent analysts' estimates);

B12.1.3 First NZ Capital use 6.89%; and

B12.2 within the range of estimates made by PwC for Vector (6.03%) and Horizon (6.33%).[289]

B13 These comparators support the reasonableness of the mid-point estimate of WACC.

Assessment of reasonableness of the 67th percentile WACC estimate for EDBs

B14 After standardising for risk-free rates, our 67th percentile estimate of WACC is within the range of the independent estimates of WACC for Transpower. Specifically:

B14.1 our 67th percentile estimate is 6.57%; and

B14.2 the independent broker estimates for Transpower range from 5.95% to 6.89% (as detailed above).

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[288] Other (unregulated) businesses are likely to have a higher cost of capital than regulated services. We recognise that Transpower has unregulated business, but these are relatively smaller proportionally than for other comparators (such as Vector and Horizon).

[289] PwC, "Appreciating Value", 5th Edition, (June 2014), page 21.

B15 After standardising for risk-free rates, our 67th percentile estimate of WACC is within the range of the independent estimates of WACC for Vector and Horizon. Specifically, it is:

B15.1 above the WACC estimates PwC has published for Vector and Horizon;

B15.2 within the range of estimates of Vector's WACC made by research analysts employed by NZ investment banks. These estimates range from 6.4% to 7.2%; and

B15.3 very close to the average of broker WACC estimates for Vector of 6.7%.

B16 As we explained in our 2010 IM reasons paper we would expect the estimates for Vector's cost of capital to be above the IM estimate of WACC for an EDB.[290] In particular, the estimates of Vector's post-tax WACC cover all of Vector's businesses (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.[291] We also allow a higher WACC for gas pipeline businesses.

B17 The difference between our 67th and 75th percentile estimates of WACC for an EDB is 0.25% per annum. A change of this size is less than the divergence in view (ie, the range) between the estimates of WACC made for each of Transpower and Vector by independent broker analysts:

B17.1 there is a 0.94% difference between Forsyth Barr and First NZ Capital's estimates of WACC for Transpower; and

B17.2 there is a 0.77% range of WACC estimates for Vector (after standardising for the risk-free rate) and 1.13% (without standardising).

B18 In our view, the comparator information supports a conclusion that a move from the 75th to the 67th percentile estimate of WACC, to reflect the new information now available to us, will continue to result in use of an estimate of WACC to set price-quality paths that is in line with independent estimates of WACC for the provision of electricity lines services in New Zealand.

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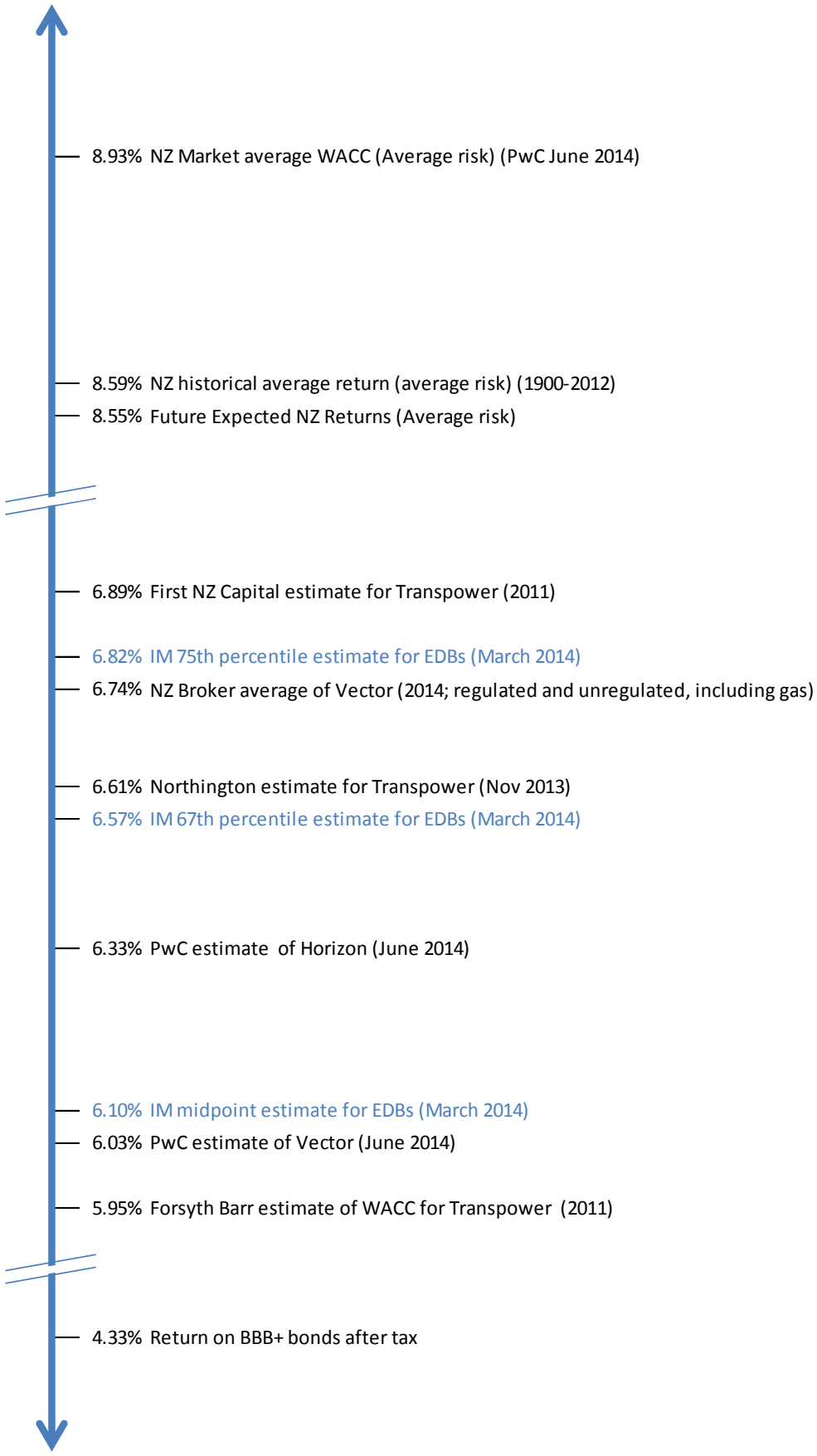
290 Commerce Commission "Input methodologies (Electricity Distribution and Gas Pipeline Services): Reasons Paper" (December 2010), paragraph H13.54.

291 This view is supported by estimates from the brokers. For example, we understand Forsyth Barr and First NZ Capital have estimates of WACC for Vector's other businesses that are higher than that applied to Vector's electricity distribution activities.

B19 Figure B1 below shows the comparator information, and our mid-point, 67th and 75th percentile WACC estimates. It shows that use of the 67th percentile estimate of WACC for EDBs would be closer to but slightly above the mid-point of the distribution of estimates for Transpower.

Figure B1: Summary of comparator information and our estimates of WACC (using standardised risk-free rates)



Assessment of reasonableness of the 67th percentile WACC estimate for GPBs

B20 As in 2010, there is little information for assessing the reasonableness of the 67th percentile WACC estimate. However, we note that the 67th percentile estimate of WACC for GPBs (which is 7.34% using the risk-free rate and debt premium as at 1 April 2014) is:

B20.1 0.28% less than the estimate produced using the 75th percentile for a GPB but still 0.77% above the 67th percentile estimate of WACC for an electricity lines business;

B20.2 above all the estimates for Transpower, and 0.60% above the average broker estimate of WACC for Vector;[292] and

B20.3 similar to Forsyth Barr's estimate of WACC for Vector's gas pipeline business (7.29%, using standardised risk-free rates).

B21 Based on the available evidence, we conclude that moving from the 75th to the 67th percentile estimate of WACC for GPBs will still result in a commercially realistic estimate of WACC for a GPB.

Is our risk premia above the government bond rate inadequate?

B22 CEG (for Wellington Electricity) submitted that the Commission should not be considering removing the 75th percentile from the IM WACC without also revisiting the IM mid-point WACC.[293] Its submission was based on a comparison of:

B22.1 the implied premium in our WACC above the NZ Government bond rate; relative to

B22.2 the implied premium above the government bond rate implied in regulatory decisions for EDBs in Australia, the UK and the United States of America.

B23 CEG's analysis does not persuade us that we should revisit our mid-point estimate of WACC.

B23.1 CEG's analysis essentially compares estimates of WACC which incorporate long-term averages of the risk-free rate, with our estimate of the WACC which uses a spot rate for the risk-free rate. When interest rates are below long-term averages, as they currently are, it is unsurprising that our implied premia appears relatively small.

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[292] For the reasons in paragraph B16 we would expect it to be above an estimate for all of Vector, due to the size of Vector's electricity lines business which we consider has lower risk.

[293] Competition Economists Group "International precedent relevant to the 75th percentile" (report prepared for Wellington Electricity Lines Limited, April 2014).

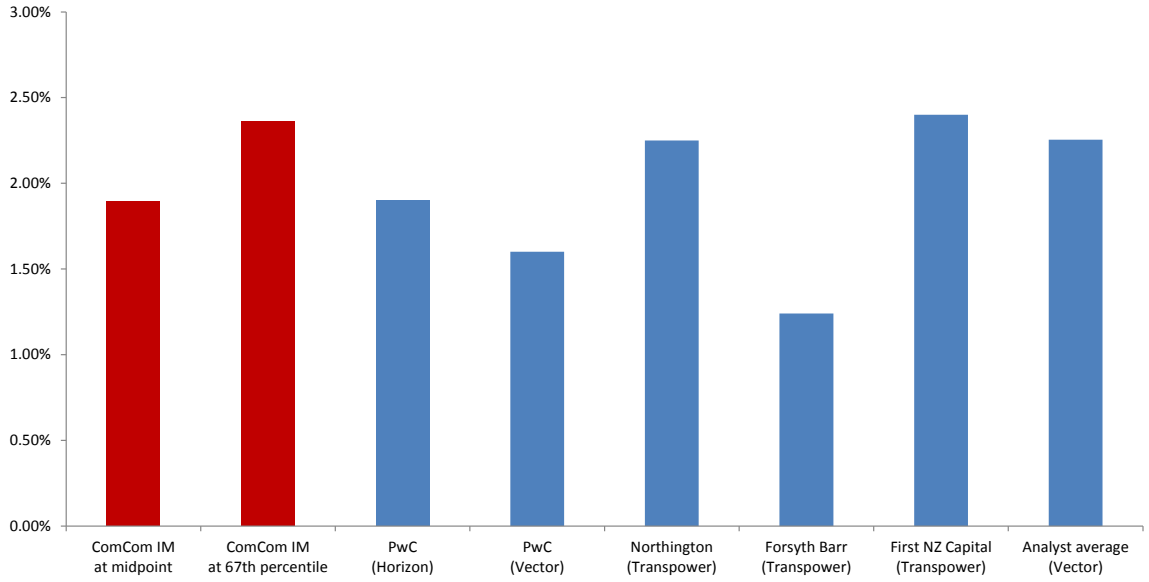
B23.2 CEG's analysis makes no allowance for differences in tax treatment between jurisdictions. In particular, our estimate of WACC is after allowing for taxes payable by investors, whereas the UK and US estimates are before investor taxes.

B23.3 CEG's analysis does not discuss why, if the NZ risk premia is unattractive relative to that allowed by regulators overseas, the stake in Powerco still attracted strong buyer interest (including from international investors) and was transacted at a significant premium to Powerco's RAB, and why Vector too trades at an implied premium to its RAB.

B24 In the graph below we compare our allowed premia over the government bond rate with the independent estimates of the WACC for NZ regulated businesses (that is, the PwC and broker estimates for Transpower, Horizon, and Vector reported above). We note these estimates are free from the methodological issues in CEG's analysis that we noted in paragraphs B23.1 and B23.2).

B25 Figure B2 below shows that our mid-point WACC allows a premia over the five-year risk-free rate that is in line with the premia for risk assumed by New Zealand analysts for companies of comparable risk (ie, Transpower, and Horizon), and the premia in the 67th percentile WACC estimate is generally above that implied in the independent analysis. The implied premium for Vector includes all of its business units, most of which have higher risk (and therefore a higher premia) than an EDB.[294]

Figure B2: WACC premia allowed by New Zealand analysts



294 Accordingly, we allow a higher WACC (and a higher risk premia) for gas pipeline businesses. The implied premia for GPBs is 3.13%, which is a higher premia than any other reported in Figure B2.

Attachment C: An uplift to WACC when the costs are high relative to benefits

C1 This attachment explores further the point made by Professor Vogelsang, that the cost to consumers of an uplift to WACC is considerable. He notes that if the cost is high relative to the benefits, other approaches to providing incentives for investment should be explored more thoroughly.

C2 We provide in this attachment a possible approach to examining this issue. We note that the example provides only an order of magnitude estimate of the effects and involves a number of assumptions and approximations.

C3 As noted in the main body of the paper, there are a range of regulatory tools for addressing the risk associated with setting the WACC too low.[295] A requirement to supply, as well as quality and reliability standards, and the option for consumers to make capital contributions are alternatives that may be used to provide incentives for investment. In the example provided below, we assume that these options are effective at preventing underinvestment for some, but not all investment, if the 50th percentile WACC is used.

C4 We also assume that a WACC at the 67th percentile would be a sufficient uplift to induce the investment that would not be fully incentivised by these other means, and examine the cost this implies for consumers. The example is loosely based on Transpower, and draws on the insights provided by Castalia, as to what investment might be at risk if the WACC is not adequate.[296]

C5 For the purposes of this analysis we assume the following:

C5.1 The company is proposing around $1 billion of capex over a five year regulatory period.

C5.2 Of that $1 billion, 60% (or $600 million) is targeted at reliability and quality (for example, most replacement and refurbishment expenditure). We assume the company will undertake this investment to meet the reliability and quality standards that we (and other regulators) have set, if a WACC at the 50th percentile is used.

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295 See paragraph 4.20 above.

296 Castalia Limited "The Rational Response of a Regulated Transmission Company to a Low WACC" (report prepared for Transpower New Zealand Ltd, 1 May 2014), Table 5.1, page 16.

C5.3 Of the remainder ("other" investment), 40% (or $400 million) is targeted at other matters that might not be incentivised by reliability/quality standards, such as net market benefits, improved use of technology, reducing losses. We assume that this "other" investment could be incentivised by a WACC margin.

C5.4 The company has a regulatory asset base of $4 billion. If we apply a WACC uplift at the 67th percentile, the cost to consumers of that uplift relative to the 50th percentile is in the order of $100 million over the five year period.

C6 Our analysis suggests the following.

C6.1 If we assume the company would undertake none of the "other" investment if WACC is set to the 50th percentile, but all of the investment at the 67th, then consumers would be paying $500 million (ie $100 million uplift in addition to the $400 million investment cost), to provide incentives for the company to invest $400 million.

C6.2 Alternatively, if we assumed that half the "other" investment would still be undertaken in the absence of an uplift, then consumers would be paying $300 million to induce $200 million of investment.

C6.3 The deadweight loss of setting the WACC at the 67th percentile has been calculated by Oxera as being in the order of $100,000 for residential customers.[297] We have ignored this in the analysis.

C6.4 From a consumers' perspective, for the uplift to be worthwhile, the benefit cost ratio of the $400 million of investment needs to be in the order of 1.25 to be worthwhile to consumers (who pay $500 million to induce the investment) if no investment would otherwise be undertaken.

C6.5 In the scenario where half would be undertaken anyway, the benefit cost ratio would need to be 1.5.

C7 From a consumer's perspective, an issue is whether there might be a less costly way of inducing the $400m of investment, than paying a 20% to 25% premium on the investment that needs incentivising (or $200 million which requires a 40% to 50% premium).

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297 For industrial consumers Oxera's estimate was in the region of $0.75 to $1.5 million. Oxera, "Review of the '75th percentile' approach", (23 June 2014), page 34.

Attachment D: Proposed IMs amendments

Purpose of this attachment

D1 This attachment sets out proposed draft methodology amendments to the cost of capital IMs for energy businesses in accordance with s52V(2), based on our views regarding the appropriate:

D1.1 WACC percentile for price-quality path regulation; and

D1.2 WACC range for information disclosure regulation.

Proposed amendments to the cost of capital IMs

D2 We are proposing amendments to the following IMs determinations:

D2.1 *Electricity Distribution Services Input Methodologies Determination 2012* [2012] NZCC 26;[298]

D2.2 *Transpower Input Methodologies Determination* [2012] NZCC 17;[299]

D2.3 *Gas Distribution Services Input Methodologies Determination 2012* [2012] NZCC 27;[300] and

D2.4 *Gas Transmission Services Input Methodologies Determination 2012* [2012] NZCC 28.[301]

D3 The amendments to each of these determinations are detailed below.

Electricity distribution services IMs determination

D4 Replace "75th percentile" with "67th percentile" in clauses 1.1.4(2), 2.2.11(2)(b)(i), 2.2.11(3)(b), 2.4.7(2), 2.4.7(3)(b)(i), 4.4.7, 4.4.7(1), 4.4.7(2)(b), 4.4.9(1), 5.3.2(5), 5.3.4(3), 5.3.11(3)(b), 5.3.28, 5.3.28(1), 5.3.28(2)(b), 5.4.27(1) and 5.4.27(2).

D5 Replace "25th percentile" with "33rd percentile" in clauses 2.4.7(2) and 2.4.7(3)(b)(ii).

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298 For the most recent consolidated version of this determination please refer to our website at: http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/electricity-distribution/

299 For the most recent consolidated version of this determination please refer to our website at: http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/transpower-input-methodologies/

300 For the most recent consolidated version of this determination please refer to our website at: http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/gas-pipelines-2/

301 For the most recent consolidated version of this determination please refer to our website at: http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/gas-pipelines-2/

D6 Replace "0.674" with "0.440" in clauses 2.4.7(3)(b)(i), 2.4.7(3)(b)(ii), 4.4.7(2)(b) and 5.3.28(2)(b).[302]

Transpower IMs determination

D7 Replace "75th percentile" with "67th percentile" in clauses 1.1.4(2), 2.2.7(2)(b), 2.2.7(3)(b), 2.4.7(2), 2.4.7(3)(b)(i), 3.5.7, 3.5.7(1) and 3.5.7(2)(b).

D8 Replace "25th percentile" with "33rd percentile" in clauses 2.4.7(2) and 2.4.7(3)(b)(ii).

D9 Replace "0.674" with "0.440" in clauses 2.4.7(3)(b)(i), 2.4.7(3)(b)(ii) and 3.5.7(2)(b).

Gas distribution services IMs determination

D10 Replace "75th percentile" with "67th percentile" in clauses 1.1.4(2), 2.2.11(2)(b), 2.2.11(3)(b), 2.4.7(2), 2.4.7(3)(b)(i), 4.4.7, 4.4.7(1), 4.4.7(2)(b), 4.4.9(1), 5.3.2(5), 5.3.4(3), 5.3.11(3)(b), 5.3.28, 5.3.28(1), 5.3.28(2)(b), 5.5.25(1), and 5.5.25(2).

D11 Replace "25th percentile" with "33rd percentile" in clauses 2.4.7(2) and 2.4.7(3)(b)(ii).

D12 Replace "0.674" with "0.440" in clauses 2.4.7(3)(b)(i), 2.4.7(3)(b)(ii), 4.4.7(2)(b) and 5.3.28(2)(b).

Gas transmission services IMs determination

D13 Replace "75th percentile" with "67th percentile" in clauses 1.1.4(2), 2.2.11(2)(b), 2.2.11(3)(b), 2.4.7(2), 2.4.7(3)(b)(i), 4.4.7, 4.4.7(1), 4.4.7(2)(b), 4.4.9(1), 5.3.2(6), 5.3.4(3), 5.3.11(3)(b), 5.3.24, 5.3.24(1), 5.3.24(2)(b), 5.5.22(1) and 5.5.22(2).

D14 Replace "25th percentile" with "33rd percentile" in clauses 2.4.7(2) and 2.4.7(3)(b)(ii).

D15 Replace "0.674" with "0.440" in clauses 2.4.7(3)(b)(i), 2.4.7(3)(b)(ii), 4.4.7(2)(b) and 5.3.24(2)(b).

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[302] 0.674 and 0.440 are the critical values of the normal distribution for the 75th and 67th percentiles respectively.

Attachment E: Material before the Commission for the purpose of any subsequent appeals

E1 In the Commission's view, the following material will be 'before the Commission' for the purposes of s 52ZA(2) in any subsequent appeals of the final WACC percentile decision for electricity lines and gas pipelines services.

E1.1 The reasons papers for the final IMs determinations for electricity distribution and gas pipeline services, and Transpower, published in December 2010.

E1.2 High Court decision: *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [December 2013]

E1.3 Invitation to have your say on whether the Commerce Commission should review or amend the cost of capital input methodologies, published on 20 February 2014.

E1.4 Further work on the cost of capital input methodologies: process update and invitation to provide evidence on the WACC percentile, published on 31 March 2014.

E1.5 Notice of intention to begin work on potential amendments to input methodologies for electricity distribution services, gas pipeline services, airports, and Transpower, published on 31 March 2014.

E1.6 Further work on cost of capital input methodologies: process update, published 23 June 2014, and the six papers released by the Commission on the same date.

E1.6.1 Five independent expert reports by Oxera, Professor Ingo Vogelsang, Professor Julian Franks, Dr Martin Lally and Economic Insights.

E1.6.2 Commission regulatory incentives and cost of capital working paper.

E1.7 The further independent expert report by Professor Ingo Vogelsang released by the Commission on 10 July 2014.

E1.8 This draft decision paper, and the review of submissions by Oxera that will be released by the Commission on the same date.

E1.9 The review of the draft decision paper by Professor Ingo Vogelsang, to be released by the Commission on or about 1 August.

E1.10 Submissions and cross-submissions on all documents referred to at paragraphs E1.6 to E1.9 above that were received prior to the deadlines set out in para1.32.

E1.11 The final amended IMs determinations (if any) and reasons paper for that final decision, to be published by the Commission on or about 31 October 2014.

E1.12 All material referenced in any of the above documents.