

Input methodologies review draft decisions

Topic paper 1: Form of control and RAB indexation for EDBs, GPBs and Transpower

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Associated documents

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22 June 2016 (expected)	1178-2560	Draft amendments to <i>Electricity Distribution Services Input Methodologies Determination 2012</i> [2012] NZCC 26
22 June 2016 (expected)	1178-2560	Draft amendments to <i>Gas Distribution Services Input Methodologies Determination 2012</i> [2012] NZCC 27
22 June 2016 (expected)	1178-2560	Draft amendments to <i>Gas Transmission Services Input Methodologies Determination 2012</i> [2012] NZCC 28
22 June 2016 (expected)	1178-2560	Draft amendments to <i>Commerce Act (Specified Airport Services Input Methodologies) Determination 2010</i> (Decision 709, 22 December 2010)
22 June 2016 (expected)	1178-2560	Draft amendments to <i>Transpower Input Methodologies Determination 2012</i> [2012] NZCC 17

Commerce Commission
Wellington, New Zealand

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Executive summary

Purpose of this paper

- X1. The purpose of this paper is to explain, in relation to the form of control and the indexation of the regulatory asset base (**RAB**) topics:
 - X1.1 the problems we have identified within these topic areas;
 - X1.2 our proposed solutions to these problems;
 - X1.3 the reasons for our proposed solutions; and
 - X1.4 how we have taken stakeholders' submissions into account in considering the above.
- X2. This paper is relevant to electricity distribution businesses (**EDBs**), gas pipeline businesses (**GPBs**) and Transpower.

Overview of the form of control and RAB indexation

- X3. We propose that non-exempt electricity distribution businesses be regulated under a revenue cap rather than a weighted average price cap (**WAPC**). This would remove the quantity forecasting risk which is associated with inappropriate incentives on suppliers to potentially underinvest. The change to a revenue cap would also remove potential disincentives on EDBs to restructure prices to price more efficiently, and remove the potential disincentives to pursue energy efficiency and demand-side management initiatives.
- X4. Both we and the Electricity Authority (**EA**) consider that there are very significant long-term benefits to consumers as a result of reforming the pricing of the services that EDBs deliver, including electricity. The IMs do not contain specific requirements relating to pricing; however our proposal to change the form of control for EDBs from a price cap to a revenue cap is, in part, because we consider this may remove a potential barrier to EDBs restructuring pricing approaches. We recognise that this may also change other incentives on EDBs to restructure prices. It is unclear what the overall balance of incentives may be as a result of this change. The EA, whose responsibility includes distribution pricing, have prepared a letter where they elaborate on some of these other incentive effects and other evolving factors that may affect EDBs incentives to reform prices. As part of the consultation on our draft decisions, we invite submitters to comment on this letter, which we have published alongside this topic paper.
- X5. We propose maintaining a revenue cap for gas transmission businesses (**GTBs**) but changing the design to move a pure revenue cap allowing for wash-up of over and under-recovery of revenue. We consider that changing from the current revenue cap design, which uses lagged quantities, to a pure revenue cap will avoid any windfall gains and losses of revenue and therefore avoid any potentially inappropriate incentives for GTBs to under-spend on the network. Removing the use of lagged quantities should also remove any existing compliance barriers for GTBs to offer

more innovative tariffs, and in particular should allow for capacity auction-based pricing to be more readily introduced which is intended to ensure more efficient utilisation of pipeline capacity.

- X6. We propose to maintain a WAPC using lagged quantities for gas distribution businesses (**GDBs**). However, we propose improving the operation of the existing WAPC for GDBs by amending the current specification of price IMs to adopt the pass-through balance approach for forecasts of pass-through and recoverable costs.
- X7. We have not considered in detail whether to change the form of control for Transpower because the regime that Transpower is subject to is unique and there have been no issues raised with it.
- X8. We have not identified any problems in relation to our approach to RAB indexation for EDBs and GPBs. Therefore, in our judgement, no change is needed to our existing approach. We have not seen evidence to suggest that we should change our policy intent from targeting ex-ante real financial capital maintenance (**FCM**) to targeting nominal returns. We continue to consider that providing an expectation of, and delivering (all else equal), real FCM promotes incentives to invest.
- X9. We consider that continuing to not index the value of Transpower's RAB for inflation, which differs from the approach for EDBs and GPBs, remains appropriate. However, we note that a possible problem with retaining the current approach is that Transpower and consumers are exposed to inflation risk. We consider it would be appropriate and straightforward to introduce a mechanism to protect both from this risk, and we are therefore interested in whether interested parties consider the benefits are sufficiently material to justify doing so.
- X10. Table X1 summarises the areas in the form of control and RAB indexation topics where our analysis has led us to propose changes to the IMs. The issues that we have considered in relation to these topics which have not resulted in proposed changes are discussed as part of the following chapters in this paper.

Table X1: Summary of proposed changes in relation to this topic

Proposed change	Outcomes of the proposed change	Chapter
<p>We propose to change the form of control for EDBs from a lagged WAPC to a 'pure' revenue cap.</p>	<p>The outcomes of this proposed change would be:</p> <ul style="list-style-type: none"> • it would remove the quantity forecasting risk, and therefore any potentially detrimental effect of that risk on EDBs incentives to spend efficiently; • it would remove potential compliance disincentives on suppliers to restructure their tariffs to be more allocatively efficient (although this might be offset to some extent by a reduction in the short term in incentives for efficient pricing provided by a revenue cap); and • it would remove a potential disincentive on suppliers to pursue energy efficiency and DSM initiatives. <p>The change to a revenue cap would shift some within-period demand risk to consumers. However, we consider that this negative aspect would be offset by other benefits.</p>	Chapter 2
<p>We propose to amend the form of control for GTBs, by moving to a 'pure' revenue cap which includes a wash-up of over and under-recoveries.</p>	<p>The outcomes of this proposed change would be that:</p> <ul style="list-style-type: none"> • it will avoid any windfall gains and losses due to the lagging mechanism, and avoid any potentially inappropriate incentives for GTBs to under-spend on the network; • it will remove any existing compliance barriers for GTBs to offer more innovative tariffs, and in particular should allow for capacity auction-based pricing to be more readily introduced which is intended to ensure more efficient utilisation of pipeline capacity. 	Chapter 3

<p>We propose to amend the treatment of forecast of pass-through and recoverable costs for GDBs to adopt the pass-through balance approach that is currently in place for EDBs under a WAPC.</p>	<p>The outcome of this proposed change would be that pass-through and recoverable costs would be more accurately reflected in prices earlier than the current regime.</p>	<p>Chapter 4</p>
<p>Our proposed change to the RAB indexation for Transpower is to deliver real FCM ex-post. We propose to create an annual capital charge adjustment through the maximum allowable revenue (MAR) wash-up.</p>	<p>The proposed change is intended to protect both consumers and Transpower from inflation risk.</p>	<p>Chapter 6</p>

X11. This topic paper forms part of our package of draft decisions papers on the input methodologies (**IM**) review. As part of the package of papers, we have also published:

X11.1 A summary paper of our draft decisions;

X11.2 An introduction and process paper which provides an explanation of how the papers in our draft decisions package fit together; and

X11.3 A framework paper which explains the framework we have applied in reaching our draft decisions on the IM review.

Invitation to make submissions

X12. We invite submissions on this paper by **5pm on 28 July 2016**. We then invite cross submissions by **5pm on 11 August 2016**.

X13. Please address submissions and cross submissions to:

Keston Ruxton
Manager, Input Methodologies Review
Regulation Branch
im.review@comcom.govt.nz

X14. Please clearly indicate within your submission which aspects of this paper it relates to.

Chapter 1: Introduction

Purpose of this paper

1. The purpose of this paper is to explain in relation to the topics of form of control and indexation of the regulatory asset base (**RAB**):
 - 1.1 the problems we have identified within these topic areas;
 - 1.2 our proposed solutions to these problems;
 - 1.3 the reasons for our proposed solutions; and
 - 1.4 how we have taken stakeholders' submissions into account in considering the above.

Where this paper fits in to our package of draft decisions papers

2. This topic paper forms part of our package of draft decision papers on the input methodologies (**IM**) review. For an overview of the package of papers and an explanation of how they fit together, see the Introduction and process paper published as part of our draft decision package.
3. This paper explains our proposed solutions to problems identified within the topics of form of control and RAB indexation.
4. To the extent our proposed solutions involve changes to the IMs, this paper identifies how we propose to change our existing IM decisions to account for our proposed solutions to problems within these topic areas.¹ The report on the IM review then collates our proposed changes to those existing IM decisions.²
5. Our proposed drafting changes to the IMs, including any resulting from these topic areas, are shown in the draft determinations, which will be published on 22 June 2016.
6. The framework we have applied in reaching our draft decisions on the IM review is set out in a separate paper, which is published alongside this paper.³ The framework paper explains that we have only proposed changing the current IMs where this appears likely to:
 - 6.1 promote the Part 4 purpose in s 52A more effectively;

¹ We have also identified in this paper where our preferred solutions lie outside (or partially outside) of the IMs, (for example, we propose to strengthen the information disclosure requirements on connections for EDBs as a result of moving to a revenue cap).

² We expect to publish the Report on the IM review on 22 June 2016.

³ Commerce Commission "Input methodologies review draft decisions: Framework for the IM review" (16 June 2016).

- 6.2 promote the IM purpose in s 52R more effectively (without detrimentally affecting the promotion of the s 52A purpose); or
 - 6.3 significantly reduce compliance costs, other regulatory costs or complexity (without detrimentally affecting the promotion of the s 52A purpose).
- 7. The framework paper also describes key economic principles that can provide guidance as to how we might best promote the Part 4 purpose.
 - 8. Another consideration that is particularly relevant to our draft decision on the form of control for electricity distribution business (**EDBs**) is s 54Q of the Commerce Act 1986, which requires that, among other things, we must promote incentives, and must avoid imposing disincentives, for suppliers of electricity lines services to invest in energy efficiency and demand-side management (**DSM**).

Structure of this paper

- 9. The chapters of this paper are either addressing a defined problem within the form of control and RAB indexation topics or explaining issues that were identified but which we did not consider amounted to a specific problem. Each of the chapters broadly follows the following structure:
 - 9.1 description of the issue or problem; and
 - 9.2 explanation of our proposed solution and our reasons for proposing that solution.
- 10. In describing the problems and assessing potential solutions, we explain how we have taken stakeholders' submissions into account and how they have helped to shape our views.

Introduction to this topic

- 11. In our problem definition paper, the form of control and the indexation of the RAB were both introduced under the risk allocation mechanisms topic, within the wider theme of improving the IMs that underpin risk allocation and incentives for price-quality regulation.⁴ This topic paper picks up on this, covering the form of control and RAB indexation.⁵
- 12. After reviewing submissions on our problem definition paper, we conducted analysis on the options for the form of control for EDBs, gas distribution businesses (**GDBs**), and gas transmission businesses (**GTBs**). We have not considered in detail whether to change the form of control for Transpower because the regime that Transpower is

⁴ Commerce Commission "Invitation to contribute to problem definition paper" (16 June 2015), paras 59, 114-116 and 122-125. That theme also covered improving the IMs that underpin CPP applications, which is discussed in Topic paper 2: CPP requirements.

⁵ Issues relating to RAB indexation for airports are discussed in Topic paper 5: Airports Profitability Assessment.

subject to is unique and no issues were raised with it. In February 2016 we published our emerging views on form of control to seek comments from stakeholders ahead of publishing our draft decisions. We would like to thank stakeholders for their comments on our emerging views paper; your comments have helped form our draft decisions.

13. The existing IMs specify a Weighted Average Price Cap (**WAPC**) approach for electricity and gas distribution businesses,⁶ the option of a WAPC or revenue cap for GTBs,⁷ and a revenue cap for Transpower.⁸ The revenue caps we have set for Transpower and gas transmission businesses operate in a different manner. A key difference is that the revenue cap applied to Transpower includes a mechanism to transfer certain positive or negative revenue adjustment balances from one year to the next.⁹ We therefore see a clear distinction between a revenue cap, which effectively guarantees allowable revenues and a revenue cap which does not. In this paper, we refer to a revenue cap which effectively guarantees allowable revenue as a ‘pure’ revenue cap.
14. This paper also covers our approach to RAB indexation and how it impacts EDBs, GPBs and Transpower’s exposure to inflation risk and returns. We received submissions both before and during the IM review regarding our approach for EDBs and GPBs. These chapters explain and clarify how RAB indexation works, and what the impact is on returns and exposure to inflation risk.
15. We have also sought advice from Dr Martin Lally, on several topics including RAB indexation. He agrees that our approach on RAB indexation and the outcome it delivers are consistent with our policy intent (this is discussed in Chapter 6). We published Dr Martin Lally’s advice on 20 May 2016 so that stakeholders could review his advice ahead of our draft decisions being published.¹⁰

Links between this topic paper and the 2017 gas DPP reset

16. This paper, in particular as it relates to the form of control for GDBs and GTBs, is closely linked with work on the 2017 gas default price-quality path (**DPP**) reset.
17. We intend to publish a paper as part of the gas pipeline DPP reset process on 28 June 2016 (**gas DPP implementation paper**). That paper will include further

⁶ Commerce Commission “Input methodologies (electricity distribution and gas pipeline services) reasons paper” (22 December 2010), para 8.3.7-8.3.13.

⁷ Commerce Commission “Input methodologies (electricity distribution and gas pipeline services) reasons paper” (22 December 2010) para 8.3.14-8.3.21.

⁸ Commerce Commission “Input methodologies (Transpower) reasons paper” (December 2010), para 7.3.7-7.3.10..

⁹ Commerce Commission “Setting Transpower’s individual price-quality path for 2015—2020” (29 August 2014), para C45–C49.

¹⁰ Dr Lally’s expert advice on the cost of debt, asset beta adjustments for GPBs, RAB indexation and inflation risk, and TAMRP “Review of further WACC issues” (report to the Commerce Commission, 22 May 2016).

implementation details on how our proposed IM changes relating to the form of control for GDBs and GTBs would, if confirmed, take effect at the DPP reset.

Links between this topic paper and WACC

18. Although there is a link between our draft decision on form of control and the impact on the weighted average cost of capital (**WACC**) asset beta, our draft decisions on the appropriate forms of control have been made based on their own merits. The WACC asset beta is dealt with separately in topic paper 4: cost of capital issues.
19. We do not propose making an adjustment to asset beta for EDBs or GPBs for regulatory differences. We consider that, although theoretically regulatory differences may have an effect on asset beta, we do not consider that there is sufficient empirical evidence to suggest that we should propose making an adjustment, or what that adjustment should be, at this point.

Who does this paper apply to?

20. This paper applies to:
 - 20.1 electricity distribution businesses (EDBs);
 - 20.2 gas transmission businesses (GTBs);
 - 20.3 gas distribution businesses (GDBs); and
 - 20.4 Transpower.¹¹

Invitation to make submissions

21. We invite submissions on this paper by **5pm on 28 July 2016**. We then invite cross submissions by **5pm on 11 August 2016**.
22. Please address submissions and cross submissions to:

Keston Ruxton
 Manager, Input Methodologies Review
 Regulation Branch
im.review@comcom.govt.nz
23. Please clearly indicate within your submission which aspects of this paper it relates to.

¹¹ For Transpower, we only discuss RAB indexation, not the form of control.

24. The Introduction and process paper contains further details about the submissions process. This includes:¹²
- 24.1 explaining that material provided outside of the indicated timeframes without an extension might not be considered in reaching our final decisions;
 - 24.2 providing guidance on requesting an extension to the submissions timeframes;
 - 24.3 noting that we prefer submissions on our draft decisions in a file format suitable for word processing, rather than the PDF file format; and
 - 24.4 providing guidance on making confidential submissions.

¹² Commerce Commission “Input methodologies review draft decisions: Introduction and process paper” (16 June 2016), chapter 5.

Chapter 2: Form of control for EDBs

Purpose of this chapter

25. The purpose of this chapter is to explain the problems relating to the form of control for EDBs and our proposed solution in respect of these problems.

Structure of this chapter

26. This chapter explains:
- 26.1 the three problems that we have identified with the form of control for EDBs;
 - 26.2 our proposed solution, to move EDBs from a WAPC to a 'pure' revenue cap;
 - 26.3 our reasons for our proposed solution; and
 - 26.4 our proposed design of the 'pure' revenue cap including a wash-up mechanism for over or under-recovery of revenue.

Problem definition

27. This section explains the problem definition, including how it evolved through comments from submissions.
28. A key component of the specification of price IM is the 'form of control' that is used to cap revenues or average prices under default/customised price-quality regulation. Part 4 provides us with a broad discretion to shape the form by which revenues or prices are constrained under price-quality regulation. The choice and design of the form of control mechanism can affect:
- 28.1 incentives for regulated suppliers to invest efficiently (s 52A(1)(a) and (b));
 - 28.2 incentives for regulated suppliers to price efficiently (s 52A(1)(b));
 - 28.3 incentives for regulated suppliers to invest in energy efficiency and demand-side management (s 54Q); and
 - 28.4 the allocation of demand risk between suppliers and consumers during each regulatory period.
29. For services subject to price-quality regulation under Part 4, we have primarily considered whether to apply a revenue cap or a WAPC. The existing IMs specify a WAPC for EDBs. A WAPC provides within-period average price stability for consumers but suppliers are exposed to the risk of under- or over-recovery of revenue. In contrast, a revenue cap provides suppliers with guaranteed revenue but it may lead to more price volatility for consumers within the price control period. As demand increases above forecast, average prices would fall which would benefit consumers in the short term. Conversely, when demand decreases average prices would rise.

30. There are three key problems which we have identified in relation to the WAPC for EDBs.¹³ These are that:
- 30.1 suppliers are exposed to the quantity forecasting risk which can be unmanageable and may provide disincentives to investment;
 - 30.2 there may be a disincentive under the WAPC to pursue energy efficiency and demand-side management (**DSM**) initiatives; and
 - 30.3 the current price cap and compliance requirements may create disincentives to restructure tariffs to move from one pricing approach to another.

Quantity forecasting risk

31. We consider that the quantity forecasting risk is potentially a problem because, under a WAPC, it can lead to either a significant revenue loss or a revenue gain for suppliers. When actual demand is higher than our forecast there will be a revenue gain for suppliers. If the opposite occurs and actual demand is lower than our forecast then there would be a revenue loss for suppliers.
32. The potential for the forecast to erroneously set revenue expectations too low for suppliers over a control period could potentially lead to inappropriate cut backs or deferral in expenditure and investment in order to maintain profitability. This would not be consistent with s 52A(1)(a). On the other hand, where revenue expectations are too high, this would imply an expectation of prices that are higher than they need to be.
33. Under a WAPC, if suppliers moved to other price structures, the risk of over/under-recovery of revenue would probably reduce. However, revenue recovery is at risk under a WAPC regardless of pricing structures, because a forecast is still needed. To determine a WAPC from an overall revenue allowance, a forecast of the quantum consumed of whichever 'service' the price applies to is needed. This may be volumes in kWh (for volume-based price components), maximum capacity in kVA (for capacity-based price components), maximum demand in kW (for demand-based price components) or number of connections (for fixed price components). An incorrect forecast of, for example the evolution of maximum demand or connections growth, can lead to revenue over or under-recovery.
34. A change from a WAPC to a revenue cap would shift some demand risk (ie, price volatility) to consumers within each regulatory period. The shift in risk to consumers would only occur within each regulatory period, rather than between regulatory periods, because under a WAPC if a fall in demand was expected within the

¹³ These problems have been raised in stakeholder submissions, including ENA's submission on the problem definition paper "Response to the Commerce Commission's input methodologies review paper" (21 August 2015); Unison "Submission on input methodologies review invitation to contribute to problem definition" (24 August 2015); Wellington Electricity's submission "Input methodologies review – Problem definition" (21 August 2015).

regulatory period, we would incorporate that fall in demand into the price-path and prices would be higher to reflect that.

35. In response to our problem definition paper, Wellington Electricity (WELL) highlighted that forecasting demand growth as part of the WAPC leads to windfall gains and losses to EDBs and consumers, and neither situation promotes the long-term interests of consumers.¹⁴ WELL explained that if EDBs recover materially less revenue than required to efficiently operate and invest in the network then optimal network investment will be disincentivised and consumers would be worse off in the long-term. However, if EDBs recover more revenue than required to efficiently operate and invest in the network then they are not being limited in their ability to extract excessive profits. WELL also suggested a move to a revenue cap because under a revenue cap the Commission would not need to forecast volumes and the risks to EDBs and consumers of windfall gains or losses arising under the WAPC are removed.
36. Electricity Networks Association (**ENA**) stated that “from our perspective the Commission’s forecasts have not been particularly accurate to date”.¹⁵ It also noted that accurate quantity forecasting is also likely to become more difficult over time due to the uncertainty regarding the uptake of emerging technologies and how these will impact on energy volumes.¹⁶
37. We conducted analysis to examine the materiality of the quantity forecasting risk for EDBs over the 2010-2015 price-path. Our analysis of the overall demand risk showed that although the quantity forecasting is fairly accurate on average across all EDBs, there are significant variations between EDBs. This analysis suggested that the impact on revenue for EDBs over the past five year period would have ranged between -4.5% and +7.3% of revenue. This analysis is presented in our reasons section below (para 59-67).
38. In response to our emerging views on form of control paper, Alpine Energy said that it was not convinced that the WAPC in itself is the cause of the quantity forecasting problem. It suggested that the basis on which the default price-quality path (**DPP**) is set, including forecasts, should be the Commission’s focus.¹⁷
39. Also, the Major Electricity Users’ Group (**MEUG**) suggested that moving from a WAPC to a revenue cap seems to lower the revenue risks to EDBs but does not eliminate forecasting risk,¹⁸ because it simply replaces our forecast with an EDB volume

¹⁴ Wellington Electricity's submission “Input methodologies review – Problem definition” (21 August 2015).

¹⁵ ENA's submission on the problem definition paper “Response to the Commerce Commission’s input methodologies review paper” (21 August 2015), para 84.

¹⁶ ENA's submission on the problem definition paper “Response to the Commerce Commission’s input methodologies review paper” (21 August 2015), para 85.

¹⁷ Alpine Energy “Submission to the Commerce Commission on input methodologies review – Emerging views on form of control” (24 March 2016), para 5.

¹⁸ We note that moving to a revenue cap would remove the CPRG forecasting risk but we would still forecast opex and capex as part of setting the price paths for suppliers.

forecast and then introduces a wash-up mechanism to allow faster response to forecasting errors.¹⁹ We consider that the quantity forecasting risk under a WAPC is the most significant problem raised in respect of a WAPC, as it may create inappropriate incentives for suppliers to under-spend.

Potential disincentive for energy efficiency and demand-side management

40. EDBs claim that, under a WAPC they are not incentivised to undertake energy efficiency and DSM initiatives.²⁰ This is because volumes are predominantly linked to revenue under a WAPC at present; if an EDB undertakes energy efficiency or DSM initiatives, the volume of energy used by its customers will decrease resulting in lower revenues for the EDB.
41. In our problem definition paper we suggested that the disincentive to invest in energy efficiency and DSM created by the WAPC was mitigated to some extent by the energy efficiency allowance mechanism. In response to our problem definition paper, the ENA suggested that this is a limited mitigation because the energy efficiency allowance does not extend to tariff-based measures (and tariff-based measures are likely to become more important in providing cost-effective price signals to consumers).²¹
42. We consider that the potential disincentive created under a WAPC for suppliers to invest in energy efficiency and DSM is a problem.

Potential disincentive to pursue tariff restructuring

43. In response to our problem definition paper and our emerging views paper, ENA, Vector and Unison explained that the WAPC in combination with tariff structure rules creates a barrier to restructuring, which is also not likely to be in consumers' long-term interests.²² The barriers to tariff restructuring are created because, under a WAPC, pricing restructures create volume risk where suppliers may under-recover their revenues. We consider that a pure revenue cap which does not require the use of lagged quantities would remove this potential barrier to restructuring tariffs.
44. Unison considers that revenue may be at risk for a supplier who restructures prices under the WAPC. Unison suggested that potential solutions to this problem are to either develop a mechanism within the DPP to allow EDBs to take into account behavioural responses in restructuring tariffs, or to change the form of control to a

¹⁹ MEUG "Submission on emerging views on form of control – Appendix 1 NZIER report" (24 March 2016).

²⁰ ENA's submission on the problem definition paper "Response to the Commerce Commission's input methodologies review paper" (21 August 2015), para 79; Vector "Input methodologies review – emerging view on form of control" (24 March 2016), para 12.

²¹ ENA's submission on the problem definition paper "Response to the Commerce Commission's input methodologies review paper" (21 August 2015), para 79.

²² ENA's submission on the problem definition paper "Response to the Commerce Commission's input methodologies review paper" (21 August 2015), para 87-88; Unison "Submission on input methodologies review invitation to contribute to problem definition" (24 August 2015), para 6a; and Vector "Input methodologies review – emerging view on form of control" (24 March 2016), para 11.

pure revenue cap (removing the use of lagged quantities). This would eliminate EDBs concerns about undertaking tariff restructuring.²³

45. We agree that revenue may be at risk for suppliers that restructure prices despite features put in place as part of the 2015 DPP reset to take into account behavioural response to a restructure of prices.^{24,25} Unison considers that we could go further than what has already been provided under the 2015 DPP reset but we have not been provided with additional approaches which could apply in practice. Particular situations where revenue may be at risk occur where the behavioural response to the price restructure is larger than anticipated by the supplier and accordingly was not taken into account when setting prices, or consumers continue to respond to the incentive over an extended period of time and a supplier is unable to continue to adjust the lagged quantity used for setting prices.
46. MEUG said that a move to a revenue cap seems to encourage EDBs to persist with a volume-based charging – a pricing mechanism that it claims does not support efficient recovery of network costs and shifts the risk of over-investment to consumers.²⁶ We note that the EA also considers that a WAPC provides stronger incentives for EDBs to adopt efficient prices.²⁷
47. Alpine Energy suggested that we need to consider the compliance test and not necessarily change the form of control to address this problem.²⁸
48. We consider that the potential disincentive to pursue tariff restructuring under a WAPC is a problem and that changing compliance arrangements to address the issue would not be straightforward. We do, however, acknowledge the trade-off which concerns the EA and MEUG. A revenue cap may reduce the incentives on businesses in the short term to adopt efficient prices. In the longer term, we consider that suppliers will need to adopt more efficient pricing structures if they wish to ensure that consumers do not inefficiently disconnect from the distribution network, irrespective of the form of control.

Proposed solution: Adopt a ‘pure’ revenue cap for EDBs

49. This section describes our proposed solution in respect of the form of control for EDBs.

²³ Unison “Submission on input methodologies review invitation to contribute to problem definition” (24 August 2015), para 25-26.

²⁴ Unison Networks Limited “Submission on Input Methodologies Review Invitation to Contribute to Problem Definition” (24 August 2015), para 19 – 27.

²⁵ Commerce Commission, “Default price-quality paths for electricity distributors from 1 April 2015 to 31 March 2020 - Compliance requirements paper” (28 November 2014), para 6.14 – 6.24.

²⁶ MEUG “Submission on emerging views on form of control – Appendix 1 NZIER report” (24 March 2016).

²⁷ We summarise the EA’s concerns in paras 84 -86.

²⁸ Alpine Energy “Submission to the Commerce Commission on input methodologies review – Emerging views on form of control” (24 March 2016), para 11.

50. In response to all three problems, our proposed solution on the form of control for EDBs is to change from using a lagged WAPC to a ‘pure’ revenue cap. Our key reasons for proposing this change are that it would remove:
- 50.1 the quantity forecasting risk, and therefore any potentially detrimental effect of that risk on EDBs incentives to incur expenditure efficiently (consistent with s 52A(1)(a) and (b));
 - 50.2 potential compliance disincentives on suppliers to restructure their tariffs to be more allocatively efficient (consistent with s 52A(1)(b)), although this might be offset to some extent by a reduction in the short term in incentives for efficient pricing provided by a revenue cap; and
 - 50.3 a potential disincentive on suppliers to pursue energy efficiency and DSM initiatives (consistent with s 54Q).
51. We also propose that the revenue cap would include an annual unders and overs wash-up mechanism with implementation features intended to:
- 51.1 be consistent with applying the ex-ante financial capital maintenance (**FCM**) principle,²⁹ while providing incentives for the supplier to mitigate the potential price and quality impact on consumers of catastrophic events, or other events involving a major demand shock; and
 - 51.2 reduce the risk that consumers are exposed to price shocks and volatility.
52. To give effect to this proposed solution, we propose to amend the current specification of price IM to reflect the change of form of control, the use of current rather than lagged quantities and to provide for the wash-up mechanism (as described below).³⁰

Reasons for our proposed solution

53. This section explains our assessment of the form of control for EDBs and our reasons for our proposed solution. Consistent with the framework for the review, having considered the pros and cons of this and other solutions, we consider that this solution best promotes the long-term benefit of consumers because suppliers would be better incentivised to invest efficiently without the risk of forecasting error, and the potential disincentive to restructure tariffs and price efficiently would be removed. We consider these effects outweigh the negative effects of shifting demand risk to consumers within the period and the potential reduction in incentives for tariff efficiency in the short term with a revenue cap.

²⁹ The FCM principle is explained in the framework paper for our draft decisions. See Commerce Commission “Input methodologies review draft decisions: Framework for the IM review” (16 June 2016).

³⁰ The Report on the review will capture the existing policy decisions that will change as a result of our proposed solutions. We expect to publish the Report on the IM review on 22 June 2016.

54. We considered the pros and cons of moving EDBs from a WAPC to a revenue cap from the following dimensions:
- 54.1 incentives for efficient expenditure;
 - 54.2 incentives for energy efficiency and DSM;
 - 54.3 incentives for pricing efficiency and tariff restructuring;
 - 54.4 connection incentives; and
 - 54.5 price stability.

Incentives for efficient expenditure

55. When we originally set the IMs, we noted that suppliers were better placed to manage demand risk than consumers, but we did not differentiate between the different elements of demand risk.³¹ Under the WAPC approach suppliers are exposed to the demand risk once the price-path is set for each regulatory period, but consumers are also exposed to it in the long term (as they bear the risk that demand decreases and costs are spread across the remaining consumers when the price paths are reset).
56. We now view overall demand risk as comprising of two elements:
- 56.1 ‘demand uncertainty risk’ – the inherent uncertainty in future demand over the time period of the price-quality path; and
 - 56.2 ‘quantity forecasting risk’ – the extent to which our forecast diverges from the supplier’s own expectations.
57. Depending on whether actual revenue ends up significantly lower or higher than supplier expectations, the quantity forecasting risk may have an impact on suppliers’ incentives to spend less or more than efficient levels of capital (and operating) expenditure within the regulatory period.
58. Moving to a pure revenue cap would remove the quantity forecasting risk for both suppliers and consumers because quantity forecasting for setting the price-path would no longer be necessary. However, the change to a revenue cap would shift some within-period demand risk to consumers. The shift in demand risk may be better mitigated by suppliers than consumers because suppliers can set prices to encourage demand, engage in marketing etc. However, we consider this negative aspect would be offset by other benefits. Given the potential magnitude of possible forecasting error, we think that the benefits of removing the quantity forecasting risk outweigh the fact that the demand uncertainty risk will shift further to consumers.

³¹ As is discussed in our Framework paper, one of our key economic principles is that risks should be allocated to those best placed to manage them (as long as doing so is consistent with s 52A).

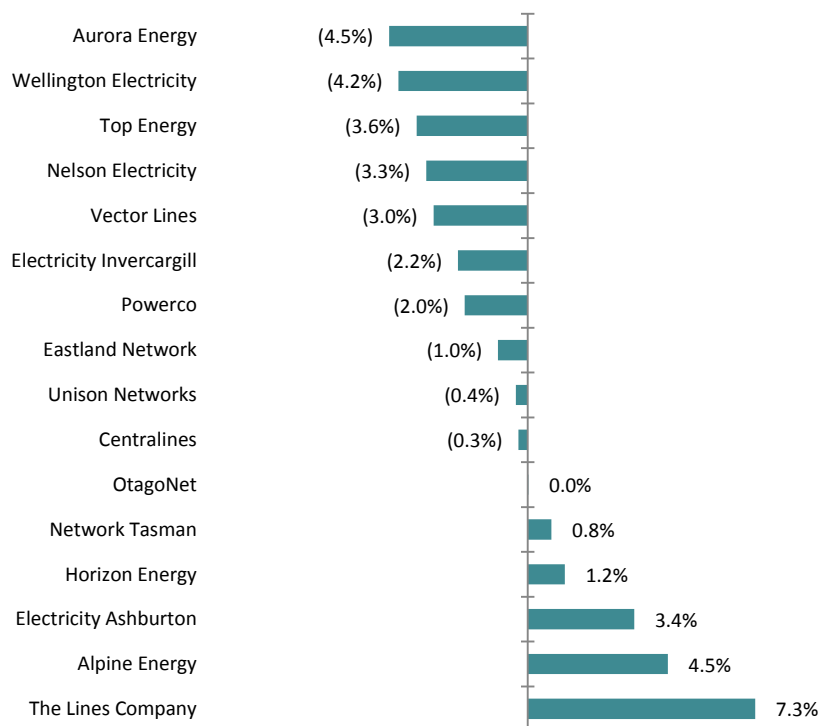
59. As part of our recent report analysing EDB profitability,³² we examined the materiality of the overall demand risk that EDBs were exposed to under a WAPC. That report identified the consequences for profitability of differences between the forecast and actual impact of changes in demand on revenue growth. Our analysis centred on a three year period consistent with the time period we focussed on when DPPs were reset mid-period.
60. Our findings for the three year period were that:
- 60.1 our forecasts generally performed well, on average, with the aggregate impact of changes in billed quantities accounting for only -0.22 percentage points of the variance between forecast and actual returns; and
 - 60.2 alongside operating expenditure, the revenue growth assumption showed the largest variation in terms of the impact on the returns of individual distributors (ranging from -1.0 to 1.4 percentage points).³³
61. As part of the modelling that accompanied the report, we also considered the impact on profitability over a five year period. Extrapolating the analysis over five years was possible because, in November 2012, we developed forecasts for a full five year period, but only applied the constant price revenue growth (**CPRG**) assumption for the time period covered by our analysis.
62. Modelling the impact on present value (**PV**) revenue over 5 years is important because variation in revenue growth has a more significant effect over a longer time period. For example, if revenue growth is lower than expected in year one of the regulatory period then, all other things being equal, the revenue expected in each subsequent year will also be lower than expected. By contrast, a variation in revenue growth in the final year affects that year alone.
63. The numbers in Figure 1 are not directly comparable to the figures quoted in the profitability report, because they measure the impact on the PV of revenue rather than the impact on returns. The numbers in Figure 1 do however give a sense for the materiality of the issue. For example, as noted previously, a one percentage point change in returns is equivalent to around a 10 percent change in returns. Even over a three year period, the revenue growth forecast explains around -10% to +14% of returns in nominal terms. The impacts shown in Figure 1 would translate into even larger impacts owing to the effect described in the previous paragraph.

³² Commerce Commission “Profitability of Electricity Distributors Following First Adjustments to Revenue Limits” (8 June 2016).

³³ Notably, one percentage point of returns is equivalent to over 10% of the expected nominal return of 8.77%. The two most material effects--operating expenditure and revenue growth—generally operated in offsetting directions, but not by the same magnitude. For more explanation see Commerce Commission, Profitability of Electricity Distributors Following First Adjustments to Revenue Limits (8 June 2016), p.21-22.

64. Our five year analysis indicated that although the variation is relatively limited on average across all EDBs, there are significant variations between individual EDBs. The analysis suggested that the impact on revenue for EDBs over the past five year period would have ranged between -4.5% and +7.3% of revenue (shown in Figure 1). This is the impact for the years ending 2011 through to 2015.
65. The modelled impact suggests that the PV revenue for some EDBs would have been significantly lower than forecast, for example the impact on Aurora Energy would have been -4.5% and the impact on Wellington Electricity would have been -4.2%. However, for other EDBs their revenue would have been higher than forecast, such as The Lines Company (7.3%) and Alpine Energy (4.5%).
66. Amongst other things, the levels of variation shown in Figure 1 are based on differences between the actual and assumed pricing structures adopted by distributors. Therefore the impacts reflect any action taken by distributors to restructure tariffs in response to any pricing incentives inherent in a WAPC.
67. It is also worth noting that the forecasts used in the analysis were developed midway through the five year period, in November 2012, and as a result may have been more accurate than it will be in future. This is because we relied on actual information where it was available, eg, for GDP, and number of connections.

Figure 1: Modelled impact of CPRG assumption on PV revenue (2011-2015)



68. Overall, given the significant exposure of EDBs to quantity forecasting risk under a WAPC, we consider that moving EDBs from a WAPC to a revenue cap will help to better promote incentives for efficient expenditure, consistent with s 52A(1)(a) and (b).

Incentives for energy efficiency and demand-side management

69. We consider that energy efficiency and DSM is an important dimension from which to consider the relative merits of a revenue cap. We consider that moving EDBs from a WAPC to a revenue cap will help to better promote s 54Q.
70. Under a revenue cap, EDBs would have better incentives to support demand-side management, energy efficiency and emerging technologies that defer or minimise traditional network investment. Revenue is set and therefore investing in these activities, which may reduce demand, will not change the supplier's revenue.

Incentives for pricing efficiency and tariff restructuring

71. We consider that pricing efficiency and tariff restructuring is an important dimension to consider. The chosen form of control may affect the flexibility regulated suppliers have to adjust their pricing levels and structures, and their incentives to price efficiently.
72. We consider that there are challenges for suppliers to set efficient prices that send the correct signals for future investments while recovering the costs of past investments in a least distortionary manner, taking into account consumer responsiveness to price changes.
73. Factors that potentially affect consumer demand, which drives network investment needs, include: the level of charges, the unit basis for charging (eg, by ICP, kWh, kW, or kVA), the relevant time period the charges relate to (eg, annually, monthly, or half-hourly), and any differences to reflect the interruptibility of supply. Other issues that may create challenges for suppliers include the extent to which the structure of distribution network tariffs are reflected in retailer tariff structures to end consumers, and concern from the general public about changes to tariff structures.
74. Although we consider that in theory the WAPC should be expected to incentivise efficient pricing (which was one of our reasons for choosing a WAPC for EDBs in 2010),³⁴ we have not seen this happening in practice. We understand that suppliers are deterred from restructuring their tariffs because of the risk of non-compliance with their regulatory obligations (ie, breaching their price path), or the risk of under-recovering revenue. Moving to a revenue cap will allow suppliers more flexibility to restructure tariffs and ensure that opportunities to change tariff structures that might result in more efficient pricing are not restricted.
75. So our proposal to introduce a revenue cap removes a barrier to tariff restructuring, but may weaken some of the incentives that theory suggests a WAPC places on EDBs to price efficiently.

³⁴ Commerce Commission "Input methodologies (electricity distribution and gas pipeline services) reasons paper" (22 December 2010), para 8.3.8.

76. However, recent work suggests that efficient pricing may still not be seen in practice under the WAPC, even if we resolved the compliance issue to encourage tariff restructuring. The Australian Energy Regulator (**AER**) explained that the WAPC does not necessarily create the incentive to set efficient prices in practice. It suggested that the theoretical advantages of the WAPC rely on assumptions that do not apply to electricity distributors.³⁵ These three assumptions are that:³⁶
- 76.1 distributors have the expertise, incentive, infrastructure and independence to set prices to maximise profit;
 - 76.2 distribution network tariffs are reflected in retailer tariffs to consumers; and
 - 76.3 consumers are fully informed about price changes, and are capable of understanding and incentivised to response to price signals.
77. Vector suggested that in future, the need for innovative network tariffs will become more frequent as the impact of emerging technology becomes more significant. However, they submitted that the current tariff restructuring requirements under the WAPC are onerous, which impede tariff innovation. This would be resolved by moving to a revenue cap.³⁷
78. WELL considers that under a revenue cap EDBs would have positive incentives to move towards more cost reflective tariffs.³⁸ It suggests that the lower volume risk will enable EDBs to be more innovative with their pricing without the fear of unintended revenue loss or compliance issues. It suggests that this will also enable clearer price signals to encourage consumer responses that could potentially assist to reduce peak demand periods to defer network capital expenditure.
79. We note that the choice of the form of control is not the only factor that can potentially positively incentivise more efficient pricing. For instance, independent, publically available reviews of EDB pricing practices have scored pricing methodologies against efficient pricing principles, and highlighted examples of particularly good practice.³⁹ We welcome views on the extent to which other factors might assist in positively promoting more efficient pricing if the disincentives to tariff restructuring provided by a WAPC were to be removed as a result of moving to a revenue cap.

³⁵ The EA states that it does not agree with the AER that all three factors must hold fully in order for more efficient pricing to emerge under a WAPC. Electricity Authority “Possible implications for efficient distribution pricing of a decision to change the form of control for electricity distribution businesses” (30 May 2016).

³⁶ AER “Stage 1 Framework and Approach - NSW Distributors” (March 2013), p.48-49.

³⁷ Vector “Input methodologies review – emerging view on form of control” (24 March 2016), para 11.

³⁸ Wellington Electricity “Input methodologies review – Commission emerging views” (24 March 2016), p.3.

³⁹ Castalia “Review of Electricity Distribution Businesses’ 2013 Pricing Methodologies, Report to the Electricity Authority” (November 2013).

80. We acknowledge that more scrutiny and/or prescription may be needed to assess efficient pricing under a revenue cap to maintain incentives on EDBs to improve pricing efficiency. This may result in increased regulatory costs (borne by either the Electricity Authority (EA) and/or us). However, as suggested by the EA, the benefits of improving distribution pricing are likely to be substantial at more than \$1 billion over the next 25 years,⁴⁰ and therefore we consider that more scrutiny and/or prescription of EDBs' pricing approaches could be worthwhile for the substantial benefits available.
81. There is uncertainty around how the form of control would impact on pricing efficiency in practice. We consider that a WAPC may better promote efficient pricing in theory, but we welcome stakeholder views on the relative merits of a revenue cap or a price cap on influencing pricing efficiency in practice, and in particular stakeholder views on the questions raised in the EA's letter, as mentioned below.
82. On balance, we consider that moving EDBs from a WAPC to a pure revenue cap (without the use of lagged quantities) would remove potential compliance disincentives on suppliers to restructure their tariffs to be more allocatively efficient (consistent with s 52A(1)(b)), although this might be offset to some extent by a reduction in the short term in incentives for efficient pricing provided by a revenue cap.
83. The EA has raised some substantive questions regarding the impact of the form of control on pricing efficiency.⁴¹ As part of its Distribution Pricing Review project, the EA is considering how distributors' incentives would be affected by a change in the form of control for EDBs from a WAPC to a revenue cap. We would like to continue to work together with the EA on this issue to develop a joint view of the best arrangements that will promote the long-term benefit of consumers. We have published a letter from the EA explaining its views on pricing efficiency under a revenue cap and we invite comments on this letter as part of our draft decision consultation.⁴²
84. The EA has suggested that although revenues are currently heavily dependent on volumes this is a business choice because the solution is within the suppliers' control, for example introducing more capacity charges. It suggests that EDBs are best placed to weigh up the volume risks against the costs of changing price structures. In response to our emerging views paper, MEUG also commented that a move to a revenue cap would encourage suppliers to persist with volume-based charging which

⁴⁰ Electricity Authority "Possible implications for efficient distribution pricing of a decision to change the form of control for electricity distribution businesses" (30 May 2016),

⁴¹ We note that if the EA makes any decision in relation to the pricing methodologies that apply to EDBs, the process under s 54V applies. This process requires the EA to consult with the Commerce Commission before amending the Code, and for the Commerce Commission to take account of any provisions relating to pricing methodologies before exercising its powers.

⁴² Electricity Authority "Possible implications for efficient distribution pricing of a decision to change the form of control for electricity distribution businesses" (30 May 2016).

it states is “a pricing mechanism that does not support efficient recovery of network costs and shifts the risk of over-investment”.⁴³

85. The EA raises the issue that under a revenue cap there is a risk of inefficient pricing as suppliers may over-price on price-sensitive customers to reduce costs. It suggests that suppliers might use this approach to compel price-sensitive customers to reduce demand to deter investment inefficiently, therefore reducing costs for the supplier and maximising profit (as revenue is already agreed).
86. The EA also suggested that efficient pricing could still emerge under a WAPC as some important factors are changing. For example, the increasing penetration of smart meters, uptake of emerging technologies, and the EA’s recent interpretation of the Low Fixed Charge regulations could result in suppliers restructuring prices more under the WAPC.

Connection incentives

87. We considered the relative merits of a revenue cap from the dimension of the incentives created for new connections because the form of control could affect suppliers’ motivation to establish new connections for consumers, which is another aspect of incentives for efficient investment.
88. A WAPC provides EDBs with an additional incentive to grow their business and pursue new connections because this will lead to higher revenues. Under a revenue cap suppliers may be less incentivised to pursue new connections because a supplier’s revenue will already be agreed and any new connections will not increase those allowed revenues through line charges, but may involve additional costs for the supplier (although they will be able to recover at least some costs through capital contributions).
89. We considered including a connections incentive mechanism for the EDBs as part of moving to a revenue cap to encourage EDBs to continue to connect new customers. However, we consider that an incentive mechanism to encourage EDBs to drive new connections would not be required because connections to the electricity distribution network are very likely to still occur without a specific incentive on the EDBs. Any capital expenditure on new connections will go into the RAB and will be taken into account at the following reset.
90. In response to our emerging views paper, some submitters said that under the revenue cap extra revenues should be permitted in the circumstance that large and unforeseen new connections occur and significantly increase costs on the network, potentially through a recoverable cost.⁴⁴ However, we do not consider that this

⁴³ MEUG “Submission on emerging views on form of control” (24 March 2016).

⁴⁴ Orion “Submission on emerging views on form of control and cost of capital” (23 March 2016), para 20; Powerco “Submission on the four emerging views papers” (29 February 2016), para 16.2; PwC “Submission to the Commerce Commission on input methodologies review: Emerging views papers – Made on behalf of 16 Electricity Distribution Businesses” (24 March 2016), p.12-13.

should be a recoverable cost as suppliers could relatively quickly recover the costs of new connections through their capital contributions policies. We note that any capital contributions received from new connections would not be constrained under a revenue cap, although the amounts must be netted off the RAB. PWC submitted that 100% up-front payments may not be affordable for all connecting parties.⁴⁵ While we acknowledge that point, we note that capital contributions could be spread over a number of years.

91. Also, WELL highlighted that greater usage of the network will spread the costs across more customers and keep average prices lower.⁴⁶ Therefore, there remains an incentive to connect new customers to retain the value of the network long term.
92. WELL also noted that to the extent that a partial disincentive for connections is created through the revenue cap, this could be addressed through ensuring the DPP allowances are set taking into account forecast connections growth on the network; and the EDBs setting individual contracts within their capital contributions policy, particularly for large scale commercial or industrial connections. We agree with WELL that EDBs have options to manage the potential connections disincentive that may be created by moving to a revenue cap.
93. As part of our proposed solution, we also propose increasing the information disclosure requirements on EDBs in the future to publically report on connections (eg, number of connection requests, timeliness of connections, etc). The purpose of the increased information disclosure requirements is to encourage EDBs to ensure they provide a good connections service to customers and to help highlight if any issues arise with the connections process.

Price stability

94. We also considered the benefits of a revenue cap from the dimension of price stability. This is because we think this is an important factor for some consumers, to the extent the predictability of future prices affects their own investment decisions, and the form of control could affect the volatility of prices either within or between price periods.
95. A revenue cap provides suppliers with guaranteed revenue but it may lead to more price volatility within the price control period than a WAPC. However, there may be a lower likelihood of volatility between periods under a revenue cap compared to a WAPC. A WAPC would provide within-period price stability but suppliers would be exposed to the risk of under-recovery of revenue.

⁴⁵ PwC "Submission to the Commerce Commission on input methodologies review: Emerging views papers – Made on behalf of 16 Electricity Distribution Businesses" (24 March 2016), p.13.

⁴⁶ Wellington Electricity "Input methodologies review – Commission emerging views" (24 March 2016).

96. We are proposing to provide for annual limits on pass-through of over and under-recovery to help manage within-period price volatility under the proposed revenue cap.

Overall view of our reasons

97. In weighing up the five dimensions from which we addressed the form of control for EDBs, we considered the quantity forecasting risk to be the most important dimension. Given the potential magnitude of possible forecasting error, and its potential effect on incentives for efficient expenditure, we consider that the long-term benefits to consumers of removing the quantity forecasting risk outweigh the fact that the demand uncertainty risk will shift further to consumers within the period.
98. We also considered that the revenue cap would allow suppliers more flexibility to restructure tariffs to be more allocatively efficient (consistent with s 52A(1)(b)), and it would better promote incentives for energy efficiency and DSM (consistent with s 54Q).

Design of the proposed revenue cap for EDBs

99. This section explains the principles behind how the proposed 'pure' revenue cap with a wash-up mechanism would work for EDBs. Further detail of how we propose the wash-up features would take effect when setting the DPP/customised price-quality path (**CPP**) determination is discussed in the gas DPP implementation paper, to be published on 28 June 2016. Many of these features are also likely to be relevant to how we might implement a revenue cap when resetting DPPs for EDBs.
100. The purpose of the wash-up mechanism is to return to, or recover from, a supplier's consumers any under or over recoveries of revenue resulting from differences between actual and forecast values. In this context the values we are referring to are quantities and consumer price index (**CPI**), as well as pass-through costs and recoverable costs. The 'pure' revenue cap will require revenue from prices to be no more than an allowable revenue amount. This would be different from the current lagged revenue cap for GTBs which requires notional revenue to be no greater than allowable notional revenue.⁴⁷

Determining the allowable revenue for each year when prices are set

101. The allowable revenue at the beginning of each year of a regulatory period would be the sum of three components:

⁴⁷ The difference between revenue and notional revenue is that revenue reflects the quantities supplied in the year to which prices apply, while notional revenues are based on quantities supplied two years prior. Quantities with a two year lag have been used in all DPP resets to date, which has meant that the quantity information to be used has been available to suppliers each year when setting prices for the forthcoming year.

- 101.1 the “net allowable revenue”, which would provide for the recovery over the regulatory period of building blocks costs. This component would grow by forecast CPI-X from each year to the next;
- 101.2 pass-through and recoverable costs; and
- 101.3 the drawdown of a wash-up account which would itself be a recoverable cost.
102. The net allowable revenue for the first year of a regulatory period would be the maximum allowable revenue in that year as calculated in the financial model for the DPP.⁴⁸
103. When a supplier is setting its prices, it will not be able to accurately price up to the allowable revenue because it will not know the quantities of services it will supply in the forthcoming year. Suppliers will forecast quantities associated with each of their prices for the forthcoming year when setting prices. We refer to this as the ‘year-ahead forecast’.
104. Each supplier would be required to set prices such that its estimate of revenue will be no more than the allowable revenue. The supplier’s estimate of revenue will equal the total of each of its prices multiplied by its year-ahead forecast quantity for that price. Its year-ahead forecasts must be demonstrably reasonable (ie, supported by appropriate reasoning and evidence).
105. Overall, the wash-up mechanism will restore each supplier to the position it would have been in had the year-ahead quantity forecast and the CPI forecast been made with perfect foresight, taking account of the time value of money. This process should remove any significant incentive for a supplier to bias its year-ahead forecast, as the wash-up should substantially restore the supplier to the perfect foresight position.

Wash-up mechanism

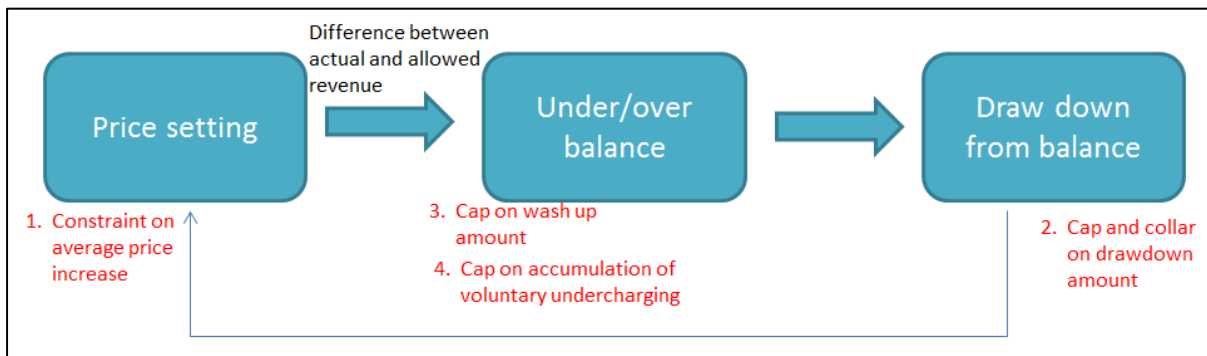
106. We propose an annual wash-up of the difference between the revenue received and the allowable revenue adjusted for CPI, pass-through costs and recoverable costs, subject to a cap on the amount that can be added to the wash-up account balance which would apply following a large demand shock, such as a catastrophic event.
107. The purpose of the wash-up mechanism is to return to, or recover from, a supplier’s consumers any under or over-recoveries of revenue resulting from differences between actual and forecast values. The amount of this difference will be available

⁴⁸ As set out in the Report on the IM review, we propose a capex wash-up adjustment would be implemented as a recoverable cost, as was done at the last EDB DPP reset. The purpose of this adjustment is to reverse any forecasting error for capex on the opening RAB at the start of the regulatory period. The mechanism for the adjustment and its rationale would be the same as for the EDB decision. Commerce Commission “Compliance requirements paper - Final decision - EDB DPP 2015-2020” (28 November 2014), Chapter 3.

to be drawn down two years after the relevant revenue year. The two-year delay arises from the time taken for information on actual revenues to become available in the subsequent pricing year, so the amount available to be drawn down can be calculated and taken into account in setting prices for the year after that.

- 108. We also propose that the wash-up deal with differences between forecast and actual CPI. The CPI-X adjustment to net allowable revenue from one year to the next would ideally recognise the CPI change to the year in which the revenues will be earned. The prices must however be set prior to that year and therefore cannot take account of CPI data that is not yet available.
- 109. We propose that the CPI adjustment to be made for the purposes of price setting be based on the Reserve Bank’s forecasts of CPI changes, and that the actual CPI change that is subsequently published by Statistics New Zealand will be factored into the wash-up.
- 110. The reason for the CPI wash-up is to ensure that it is ultimately the actual change in CPI to which suppliers and consumers are exposed, rather than to forecast values. The rationale is somewhat different from that for the quantity forecast as there will be no perverse incentive on suppliers to bias forecasts – the CPI forecast will be provided by the Reserve Bank and not from suppliers. The purpose of the wash-up will be the greater accuracy available from the wash-up mechanism.
- 111. Figure 2 shows the conceptual process and the key features of the revenue cap wash-up mechanism.

Figure 2: Conceptual diagram of wash-up mechanism process and key features



Features of the proposed wash-up mechanism

- 112. The features that we have proposed to add to a simple wash-up mechanism are described below. Although we will include the provision for each of these features in the IMs, the decision on whether they will be implemented in the price-path determination or not, and the value of any parameters, will be made following consultation at the time of the DPP resets or the making of CPP determinations.

Constraint on average price increase

- 113. The purpose of this constraint is to address the concern, when prices are set at the beginning of each year of the regulatory period, about the potential for large

downward demand shocks that result in large price increases to consumers. We propose a limit to the percentage increase in the weighted average price from one year to the next (eg, the average price cannot increase by more than x%). This feature was designed with gas transmission primarily in mind, and is less likely to be relevant for EDBs. However, we propose including the provision for this constraint in the EDB IMs to allow this feature to also be implemented for EDBs if we decide that it is required in the future.

114. This is a forward-looking constraint, so if a supplier forecasts that there is going to be a significant demand drop the constraint might take effect when setting prices.
115. The percentage limit value would be specified in a DPP s 52P determination. This cap on average price increases applies to average line charges and not to revenues.⁴⁹ The cap applies to average line charges in order to mitigate consumer price shocks. It will apply to line charges in gross terms (ie, including provision for the recovery of pass-through costs and recoverable costs), rather than net terms.
116. We propose that each supplier provide its compliance report for each year after prices have been set, but prior to the prices taking effect at the commencement of that period. Our proposed process would allow each supplier to set its prices with certainty that its prices comply with the DPP Determination.⁵⁰

Cap and collar on drawdown amount

117. The purpose of a cap and collar on the drawdown amount is to address the concern that a revenue cap may lead to price volatility within the period resulting from the wash-up process. The cap and collar aims to smooth the wash-up amounts that can be recovered across the period, to avoid large wash-up amounts affecting prices annually.
118. The cap would be the largest allowable positive drawdown balance that could be applied, expressed as a percentage of the net allowable revenue. The collar would be the largest allowable negative drawdown balance that could be applied, expressed as a percentage of the net allowable revenue. Between the cap and collar the EDBs would have the discretion to choose the drawdown amount. The percentage for the cap and the percentage for the collar would be determined as part of the DPP reset. The cap and collar would not necessarily have to be symmetric.
119. In response to our emerging views paper WELL said that introducing a capping mechanism for dealing with over or under-recoveries in a particular year is unnecessary and would introduce additional complexity. We only propose providing for the cap and collar in the IMs, and would consult on whether to implement it in a

⁴⁹ Increases in average line charges refers to the increase in the weighted average price of the services for which posted prices apply or services provided through a non-standard contract. Other services, such as connections and disconnections for credit purposes would not be included.

⁵⁰ Further information on the proposed compliance process is included in the gas DPP implementation paper. We could adopt similar processes for EDBs at the next reset also.

price-path determination prior to any DPP or CPP reset. That consultation would also consider the appropriate cap and collar on the drawdown balance.

Cap on accumulation of voluntary undercharging

120. The purpose of this constraint is to address the possibility that a large credit amount may build up in the over/under balance from EDBs intentionally undercharging. A supplier might not fully charge its consumers up to the limit of its allowable revenue. Such voluntary price reductions could result in a large positive balance building up in the wash-up account, potentially over many years, which could raise concerns about the potential for subsequent price increases to drawdown that balance. This feature would limit the extent to which undercharging may be carried forward to be recovered by higher prices in future years, and would only apply to EDBs, and potentially only those EDBs that met certain ownership criteria.
121. The mechanism for applying this limit would recognise that the constraints on price and revenue changes that are discussed earlier may force a balance to be left in the account to be carried over to the subsequent year. The identification of the amount that is intentionally and voluntarily left in the wash-up account would be the difference between the allowable revenue and the forecast of revenue, both being the amounts known to suppliers when setting prices. The constraint would be a cap on the amount of this difference that could be washed up, and would be a specified percentage of the allowable revenue. This will be specified as part of the DPP Determination.
122. The forecast allowable revenue referred to above is a forecast because it includes a forecast of pass-through and recoverable costs and because the CPI increment to the net allowable revenue is based on a forecast CPI. The forecast revenue referred to above is a forecast because it is based on the supplier's year-ahead forecast of quantities.
123. This cap will not prevent an EDB from fully pricing up to its forecast allowable revenue and the EDB will not forfeit any of its allowable revenue as a result of errors in its forecasts of quantities, pass-through costs or recoverable costs.
124. Any repeated under-recovery of allowable revenue will accumulate from year to year and be reflected in the wash-up balance. The wash-up balance will form part of the forecast allowable revenue. Any positive wash-up balance will therefore be available, subject to other constraints on pricing, to a supplier so that it could increase its prices to recover previous under-recoveries.
125. When a supplier uses its positive wash-up balance in this way to increase its prices above what would be otherwise available, the wash-up balance will be drawn down, and the drawdown amount shall be a recoverable cost.

Cap on wash-up amount

126. The purpose of this cap is to ensure that suppliers bear some of the risk if a major demand event occurs (for example, a catastrophic event). We consider that a principle established in the Orion CPP decision should be applied; consumers and

suppliers should share the risk of catastrophic events. The cap will limit the amount of the lost demand that could be recovered through the wash-up mechanism. The wash-up amount would be the lesser of:

- 126.1 the allowable revenue less the actual revenue; and
 - 126.2 $x\%$ of the allowable revenue, where the value for x is specified in the input methodology for specification of price.
127. The value of x would be specified in a s 52P determination. The value would be set sufficiently large that the cap would be unlikely to bind except after a major demand shock, such as might only occur as a result of a major catastrophic event.
128. In response to our emerging views paper, some submitters commented that an incentive to plan for catastrophic events would be unnecessary for EDBs and were concerned about the impression it would create.⁵¹ Orion questioned whether the 'pure' revenue cap would mean that any revenue shocks, such as those caused by catastrophic events, would be washed-up in subsequent years. We propose to maintain the principle established in the Orion CPP decision; that consumers and suppliers should share the risk of catastrophic events. Therefore we would include the cap on the wash-up amount so that suppliers would bear some of the demand risk.
129. In the Orion CPP decision,⁵² we explained that in our view it would be inconsistent with the Part 4 purpose for consumers to bear *all* the costs and risks of catastrophic events. Imposing the entire financial impact of catastrophic events on consumers is not consistent with the Part 4 purpose because:
- 129.1 it is unusual for consumers to bear *all* the costs and risks of catastrophic events in a workably competitive market. Workably competitive markets tend to manage risks efficiently, by allocating identified risks to the party best placed to manage them;
 - 129.2 regulated suppliers (and their investors) are generally better placed to manage the risks of catastrophic events than consumers; and
 - 129.3 allocating all the costs and risks of catastrophic events to consumers would reduce the incentives for suppliers to manage these risks efficiently (ie, create a moral hazard).

⁵¹ See for example: Orion "Submission on emerging views on form of control and cost of capital" (23 March 2016); Powerco "Submission on the four emerging view papers (29 February 2016)" (24 March 2016); PwC "Submission to the Commerce Commission on input methodologies review: Emerging views papers – Made on behalf of 16 Electricity Distribution Businesses" (24 March 2016).

⁵² Commerce Commission "Final decision for setting the customised price quality path of Orion New Zealand Ltd" (29 November 2013) para C14.

130. We consider that no additional compensation for bearing part of the demand risk is required. Our reasons for not providing additional compensation have not changed (the same reasons as our Orion CPP decision),⁵³ and are:

130.1 suppliers would only bear the demand risk until the next reset;

130.2 the materiality of demand risk is likely to be relatively minor; and

130.3 although the IMs did not “make any adjustments to the cost of capital for asymmetric risk” some allowance for the risks of catastrophic events is inherent in the IM-based WACC.

131. In our final decision for setting the customised price-quality path of Orion we explained that:

“Catastrophic events are expected to have a relatively minor impact when compared to the observed cost of capital. In the draft decision we stated:

Available evidence is that the cost of natural disasters should have a relatively small impact on the observed cost of capital (ie, likely to be less than 0.1% of WACC). For example, the Global Assessment Report on Disaster Risk Reduction estimate the total expected global loss from earthquakes and cyclone wind damage is around US\$180 billion per annum. Relative to the market value of capital provided to listed companies, this implies a cost of 0.30% per dollar of capital per annum. However, as some of the cost of loss would be insured, and since the annual global loss from earthquakes and cyclone wind damage would be shared among government, households, and private businesses as well as listed businesses, the impact on the cost of capital from earthquakes and wind damage would be substantially less than 0.30% per annum (and almost certainly much less than 0.1% per annum). By contrast, the 75th percentile estimate of WACC increases the cost of capital by greater than 0.7% per annum.

Although the total expected global loss of US\$180 billion per annum referred to in the quote above relates to earthquakes and cyclone wind damage only, this still provides a useful indication of the possible impact of natural disasters on the cost of capital.

On balance we consider that no additional compensation (either *ex ante* or *ex post*) is required for demand risk associated with catastrophic events during the CPP period. We are satisfied that Orion will continue to have incentives to invest in the absence of any additional compensation, consistent with limb (a) of the Part 4 purpose statement.”⁵⁴

⁵³ Commerce Commission “Final decision for setting the customised price quality path of Orion New Zealand Ltd” (29 November 2013) para C23.

⁵⁴ Commerce Commission “Final decision for setting the customised price quality path of Orion New Zealand Ltd” (29 November 2013) para C31-C33.

132. We also reiterated this decision in our reasons paper for the amendment to the WACC percentile for price-quality regulation.⁵⁵

Accounting for wash-up amounts in the compliance regime

133. We propose that each supplier maintain a wash-up account to account for the following.
- 133.1 The wash-up balance.
- 133.2 Any difference between a supplier's forecast of pass-through and recoverable costs and the costs actually incurred, with due account of the time value of money.
- 133.3 Amounts drawn down from the wash-up account. These amounts would be recoverable costs, and could be positive or negative.
- 133.4 Time value of money adjustments. A balance left in the account at the end of one year would be adjusted by a discount rate to reflect the opportunity cost of holding that balance for another year.
134. The proposed approach allows the wash-up mechanism to readily span regulatory periods. For example, a wash-up of the forecast error of the quantities of the fourth and fifth assessment years of a regulatory period could be washed up in the first and second assessment years of the subsequent regulatory period.
135. The revenue cap wash-up will produce a cumulative balance of under or over revenue recoveries over time. As that balance will result in the shifting of revenue over years, a discount rate will need to be applied.
136. We propose to apply a discount rate equal to the post-tax WACC at the 67th percentile for the DPP regulatory period. This approach would ensure that wash-up amounts are discounted at suppliers' opportunity cost of funds (WACC),⁵⁶ which is consistent with the principle of FCM, a key principle as expressed in our framework for the IM review.⁵⁷

⁵⁵ Commerce Commission "Amendment to the WACC percentile for price quality regulation" (30 October 2014) para 4.37.

⁵⁶ Further, this is consistent with the approach we follow in relation to smoothing the price path; in transforming the BBAR to the MAR we 'smooth' the price path on an NPV-neutral basis using the 67th percentile post-tax WACC.

⁵⁷ See Commerce Commission "Input methodologies review draft decisions: Framework for the IM review" (16 June 2016).

137. This proposed approach is similar to the approach we have used for Transpower's comparable Economic Value account. We propose using the post-tax WACC for the relevant DPP period as that is effectively the prevailing discount rate used in setting the price-path for the regulatory period.⁵⁸
138. We note also the proposed discount rate differs from the cost of debt discount rate used in respect of the pass-through balance in the current EDB DPP. However, the move to a revenue cap for EDBs will mean that this pass-through balance is superseded by the revenue cap wash-up mechanism in the next EDB DPP.
139. The compliance requirements with regard to maintaining and annually disclosing the balance in the wash-up account and any associated calculations and account entries would be specified in a DPP/ CPP determination. Further details on compliance, which would be covered in the relevant price-path determination (consistent with s 52P) rather than in the IMs, will be included in the gas DPP implementation paper due to be released on 28 June 2016. Although the gas DPP implementation paper focusses on the design of the revenue cap for GTBs, we envisage that similar processes could be adopted for the revenue cap for EDBs at the next reset.

⁵⁸ In practice, the DPP is set using a vanilla WACC.

Chapter 3: Form of control for GTBs

Purpose of this chapter

140. The purpose of this chapter is to explain the problem we have identified in relation to the form of control for GTBs and our proposed solution in respect of this problem.

Structure of this chapter

141. This chapter explains:
- 141.1 the problem we have identified with the form of control for GTBs;
 - 141.2 our proposed solution to move from a lagged revenue cap to a 'pure' revenue cap;
 - 141.3 our reasons for our proposed solution; and
 - 141.4 our proposed design of the 'pure' revenue cap, including a wash-up mechanism for over or under-recovery of revenue.
142. The upcoming gas DPP implementation paper will provide more detail on how our proposed IM changes to introduce a 'pure' revenue cap would be given effect to at the 2017 gas DPP reset.⁵⁹

Problem definition

143. This section explains the problem definition, including how it evolved through comments from submissions.
144. The existing IMs allow for us to elect between a WAPC and a lagged revenue cap for GTBs when setting price-quality paths, taking into account certain criteria set out in the IMs. Currently both GTBs are subject to a revenue cap that uses lagged quantities.
145. The main issues raised by stakeholders in respect of the current revenue cap for GTBs are:
- 145.1 The notional revenue approach which uses a two-year lagged quantity creates a barrier to GTBs offering more innovative tariffs or implementing auction-based pricing. This occurs because the lagged revenue cap requires GTBs to maintain compliance with an allowable notional revenue by setting prices based on quantities from two years previously.
 - 145.2 In addition, the lagged revenue cap means that GTBs will face either a windfall gain or loss depending on whether quantities are higher or lower than two years ago. This occurs because wash-ups for over or under-recovery do not currently apply. However, MDL also commented that the

⁵⁹ This paper is due for publication on 28 June 2016.

Commission's view in its previous decision, that gas transmission businesses had limited ability to control demand, remained sound.⁶⁰

145.3 The Major Gas Users Group (**MGUG**) claimed that the lagged quantity revenue cap exposes customers to the majority of risks that GTBs face,⁶¹ and that as a result gas customers are being exposed to increasing prices as volumes decline. We consider that gas transmission demand is difficult to forecast, and that gas demand is often impacted by factors that are out of supplier's control and therefore suppliers are not best placed to manage the demand risk (ie, either the demand uncertainty risk or the quantity forecasting risk). We also note that customers would be exposed to the demand risk in the long term under a WAPC too, because they would face the price changes between regulatory periods, reflecting updated demand forecasts at that time.

146. Although we consider that the use of a revenue cap is still appropriate, given it is difficult for GTBs to manage demand risk, we agree that the use of two-year lagged quantities in the current revenue cap design has created problems. These problems are that the use of lagged quantities creates a barrier to offering innovative tariffs, and the use of lagged quantities without a wash-up means that GTBs will face either a windfall gain or loss in revenue. We have considered how best to address these problems.

Proposed solution: Adopt a 'pure' revenue cap for GTBs

147. This section describes our proposed solution in respect of the form of control for GTBs.

Our proposed solution

148. Our proposed solution is to maintain a revenue cap for GTBs but to move to a pure revenue cap allowing for wash-up of over and under-recovery. Our key reasons for this change are:

148.1 we consider that gas transmission demand is difficult to forecast and that transmission businesses have little ability to influence demand, and so keeping a revenue cap is in the long-term interests of consumers by ensuring suppliers are more likely to be incentivised to invest efficiently compared to alternatives (consistent with s 52A(1)(a) and (b));

148.2 changing from a lagged revenue cap to a pure revenue cap will avoid any windfall gains and losses due to the lagging mechanism, and avoid any

⁶⁰ Commerce Commission "Input methodologies review - gas pipeline default price-quality path reset 2017 - Gas stakeholder meeting - 8 December 2015 - Summary of views" (22 December 2015), para 41.

⁶¹ MGUG's submission on the problem definition paper "Re: Input methodologies review" (21 August 2015), para 15.

potentially inappropriate incentives for GTBs to under-spend on the network (consistent with s 52A(1)(a) and (b)); and

- 148.3 removing the lag should also remove any existing compliance barriers for GTBs to offer more innovative tariffs, and in particular should allow for capacity auction-based pricing to be more readily introduced which is intended to ensure more efficient utilisation of pipeline capacity (consistent with s 2A(1)(b)).
149. We also propose that the revenue cap would include an annual unders and overs wash-up mechanism with implementation features intended to:
- 149.1 be consistent with applying the ex-ante FCM principle, while providing incentives for the supplier to mitigate the potential price and quality impact on consumers of catastrophic events (or other events involving a major demand shock); and
- 149.2 reduce the risk that consumers are exposed to price shocks and volatility.
150. Our original reason for using the lagged quantities in the design of the revenue cap was so that the price-path compliance quantities could be calculated at the time the supplier sets its prices. We think this is still a relevant objective but we consider that the compliance certainty we are trying to provide at the time of price setting can be addressed through other means (eg, the wash-up mechanism).
151. Some stakeholders raised the concern that, because of the differences in pricing approaches between the two gas transmission pipelines, the two GTBs should be subject to different forms of control. We consider that some of the price change differences experienced by users of the different pipelines have been partly as a result of the different interpretations by GTBs of how to demonstrate compliance given the lag in the current revenue cap, and have partly reflected the different constraints on pricing under the operating codes for the two pipelines.
152. We consider that the concern that the two GTBs should be subject to different forms of control may only be transitional because the two businesses will have a common owner and the Gas Industry Company (**GIC**) is also working to align the operating codes for the two gas transmission pipelines.⁶² We also consider that removing the choice of form of control for GTBs from the IMs would provide more certainty for stakeholders.⁶³

⁶² GIC, "Transmission Access; Options for Improvement, Paper #2" (May 2015).

⁶³ Although it was not raised by gas stakeholders specifically, in response to our problem definition paper electricity stakeholders said that the form of control should be specified within the IMs as it provides certainty for suppliers and consumers. ENA's submission on the problem definition paper "Response to the Commerce Commission's input methodologies review paper" (21 August 2015), para 67.

153. We propose amending the current specification of price IMs to reflect the changes to the form of control, the use of current rather than lagged quantities and to provide for the wash-up mechanism.⁶⁴ The amendments have been drafted to reflect the changes:

153.1 moving to a pure revenue cap as the form of control; and

153.2 providing for the wash-up process as described below.

Reasons for our proposed solution

154. This section explains our assessment of the form of control for GTBs and our key reasons for our proposed solution.

155. We considered the pros and cons of changing the form of control for GTBs from the following dimensions:

155.1 incentives for efficient expenditure;

155.2 price stability; and

155.3 incentives for pricing efficiency and tariff restructuring.

156. These are the same dimensions that we considered the form of control for EDBs against, except that two of the dimensions that were relevant to EDBs are not relevant here. The reasons why we consider these dimensions are important are noted in the previous chapter and so are not repeated here.

Incentives for efficient expenditure

157. One of our key economic principles is that risks should be allocated to those best placed to manage them.⁶⁵ We consider that gas transmission demand is difficult to forecast and is significantly influenced by factors outside of the supplier's control, such as global commodity prices and the relative cost of generating electricity from different sources, and therefore we do not think GTBs have a comparative advantage in bearing the demand risk. We consider that without being exposed to the demand risk suppliers will be better able to efficiently invest in the network (consistent with s 52A(1)(a) and (b)).

158. In response to our emerging views paper, MGUG suggested that GTBs do have an ability to forecast demand and manage the demand risk (for example through their pricing methodologies) and therefore a WAPC is a more appropriate form of control for GTBs.⁶⁶ Maui Development Limited (**MDL**) and First State Investment responded

⁶⁴ The Report on the IM review will capture the changes we would make to existing policy decisions as a result of our proposed solutions.

⁶⁵ Commerce Commission "Input methodologies review draft decisions: Framework for the IM review" (16 June 2016).

⁶⁶ MGUG "Submission on emerging views on form of control paper: 29 February 2016" (24 March 2016).

in cross submissions to our gas DPP process and issues paper, stating that they disagreed with MGUG.⁶⁷ First State Investments said that they have limited ability to manage the demand risk; for example pricing is limited as an effective demand management tool for GTBs because demand responds to total price and transmission fees make up only a fraction of the cost of delivered gas.⁶⁸

159. As gas transmission demand is subject to significant variability and the supplier has limited influence over the gas volumes transported through its pipelines, a WAPC may lead to insufficient revenues being recovered to cover costs (inconsistent with 2A(1)(a) and (b)).
160. Furthermore, changing from a lagged revenue cap to a pure revenue cap will avoid any windfall gains and losses due to the lagging mechanism, and avoid any potentially inappropriate incentives for GTBs to under-spend on the network (consistent with s 52A(1)(a) and (b)). Therefore we consider that a pure revenue cap is a more appropriate form of control for GTBs.

Price stability

161. As explained for EDBs, a pure revenue cap could mean more price volatility within a price control period compared to a WAPC. However, under the current revenue cap or a WAPC, consumers would still face those price changes if demand was expected to fall when prices were set. If the drop in demand is unexpected, customers would face the price increases at the price-path reset.
162. We consider that the proposed pure revenue cap would create less volatility than the current revenue cap by introducing features with the wash-up mechanism to target this concern. We are proposing to provide for a cap and collar on the annual drawdown amount from the wash-up balance to help manage within-period price volatility resulting from a revenue cap. We are also proposing to provide for a constraint on average price changes to address MGUG's concerns about large price shocks for consumers when demand significantly changes.⁶⁹

Incentives for pricing efficiency and tariff restructuring

163. The current revenue cap design using lagged quantities creates a barrier to suppliers offering more innovative tariffs or implementing auction-based pricing.

⁶⁷ First State Investments "Gas Default Price-Quality Path: General Matters Cross-submission" (13 April 2016) page 3; MDL "Untitled cross-submission on gas DPP process and issues paper" (13 April 2016).

⁶⁸ First State Investments "Gas Default Price-Quality Path: General Matters Cross-submission" (13 April 2016) page 3.

⁶⁹ We note that gas consumers have also raised price volatility as a problem with the current form of control compliance arrangements. Major Gas Users Group "Submission on the gas pipeline stakeholder meeting" (28 January 2016); Oji Fibre Solutions "Submission on the gas pipeline stakeholder meeting" (28 January 2016); Greymouth Gas "Submission on the gas pipeline stakeholder meeting" (28 January 2016) .

164. An amended revenue cap using current quantities would remove this barrier and allow suppliers to restructure tariffs, and in particular should allow for capacity auction-based pricing to be more readily introduced (consistent with s 52A(1)(b)).

Overall view of our reasons

165. We consider that the demand risk is still an important consideration when thinking about the form of control for GTBs because of the difficulty of forecasting demand for gas transmission. Therefore this criterion was given the greatest weighting in our assessment.
166. Price stability is also an important dimension given the small number of large consumers for whom better predictability on prices affects their investment decisions. Although the revenue cap may lead to more price volatility within the period, we have added features to the wash-up mechanism to help manage price volatility (a cap and collar on the drawdown amount and a constraint on average price increases).

Design of the amended revenue cap for GTBs

167. This section explains how the amended revenue cap and wash-up mechanism would work for GTBs.
168. The purpose of the wash-up mechanism is to return to, or recover from, a supplier's customers any under or over recoveries of revenue resulting from differences between actual and forecast values. In this context by values we are referring to quantities, CPI, and pass-through and recoverable costs.
169. The features of the wash-up mechanism are the same as the features described earlier for EDBs (Chapter 2), except that we consider GTBs should be required to drawdown the full balance subject only to the cap and collar. For GTBs we consider that the cap on average price increases is particularly important because gas transmission consumers are concerned about large demand/price shocks and the effect they can have on the small number of customers. This cap on average price would share the adjustment to the demand shock between suppliers and consumers, although ultimately consumers will have to make up the full amount in the long term. For GTBs we propose not providing for the "cap on voluntary undercharging" feature in the GTB IMs. This feature is designed only to mitigate the risk of EDBs deliberately underpricing and building up a large credit balance.
170. The wash-up drawdown amount shall drawdown the wash-up account to a nil balance each year. In other words, the balance of the account prior to drawdown shall be the drawdown amount, and this amount shall be the revenue wash-up recoverable cost.

Capacity auctions

171. In designing the revenue cap for GTBs we also did not want to implement anything that may prevent capacity auctions from being introduced. We do not consider that the pure revenue cap would prevent short-term capacity auctions as it has been implemented in other countries.⁷⁰
172. We do not envisage that any auction price would be treated as a “price” as defined by our compliance regime. Rather any revenues that a supplier receives from auction proceeds would form part of the actual revenue used to determine wash-up amounts, which would then flow to the wash-up balance. From there it would flow to the wash-up drawdown and a corresponding reduction in prices at a later date. Through this mechanism a pure revenue cap should be able to accommodate such auction proceeds reasonably readily.

⁷⁰ For example in the UK, National Grid Gas, which is subject to a revenue cap, operates a number of entry capacity auctions for users to secure access to the National Transmission System.

Chapter 4: Form of control for GDBs

Purpose of this chapter

173. The purpose of this chapter is to explain our proposals relating to the form of control for GDBs.

Structure of this chapter

174. This chapter explains:
- 174.1 why we considered changing the form of control for GDBs but have decided to maintain the WAPC for GDBs; and
 - 174.2 why we suggest amending the specification of price IM for GDBs to allow the wash-up of pass-through and recoverable costs

We considered the benefits of moving GDBs to a revenue cap

175. This section explains why we considered changing the form of control for GDBs.
176. Unlike for EDBs and GTBs, there were no specific problems raised with the existing form of control for GDBs, which is a WAPC. However, we considered whether the benefits that we identified of moving EDBs to a revenue cap may also be reasons to consider a revenue cap for the GDBs. For example, one of the key benefits we identified for EDBs of moving to a revenue cap was the removal of the quantity forecasting risk which potentially affects suppliers' incentives for efficient expenditure. We considered whether this benefit would be a significant enough reason for also moving GDBs to a revenue cap.
177. Stakeholders have highlighted that we need to consider the differences between the electricity and gas (distribution) sectors. The key difference is that gas is a discretionary fuel for the majority of consumers, giving suppliers an incentive to drive volumes to increase their revenues, and that this is best accommodated under a WAPC.
178. Although quantity forecasting was raised as a significant issue for EDBs, it has not been highlighted as a specific problem under the WAPC by GDBs. However, Powerco notes that an accurate forecast of CPRG is an important input to the WAPC setting processes and suggested that a working group be established to assess factors impacting on future gas demand and how the current CPRG mechanism can be refined.⁷¹ We are engaging with stakeholders regarding CPRG forecasting as part of the gas DPP process.
179. Also, stakeholders did not express concern with tariff restructuring under the current form of control for gas distribution. The requirement under s 54Q to incentivise energy efficiency and DSM for EDBs does not apply to GDBs.

⁷¹ Powerco "Submission on the four emerging view papers (29 February 2016)" (24 March 2016) para 20.

We propose maintaining a WAPC for GDBs

180. We propose maintaining a WAPC for the form of control for GDBs and continuing to use lagged quantities. Our reasons for this proposal are:
- 180.1 unlike for EDBs, there have not been any significant concerns raised about continuing to use CPRG forecasting for GDBs;
 - 180.2 unlike for EDBs, we do not think the WAPC creates concerns about tariff restructuring or efficient pricing for GDBs; and
 - 180.3 the WAPC provides incentives for GDBs to pursue new gas connections (consistent with s 52A(1)(a) and (b)), and we consider this to be a more important factor for GDBs than EDBs.
181. However, as we discuss further below, we propose improving the operation of the existing WAPC for GDBs by amending the current specification of price IMs to adopt the pass-through balance approach (which is currently in place for EDBs) for forecasts of pass-through and recoverable costs. This would be consistent with improvements to the operation of a WAPC introduced for EDBs at the most recent EDB DPP reset.

Reasons for not changing the WAPC for GDBs

182. This section explains our assessment of the form of control for GDBs and our reasons for proposing not to change from a WAPC.
183. We considered the pros and cons of changing the form of control for GDBs from the following dimensions:
- 183.1 connection incentives;
 - 183.2 incentives for efficient expenditure;
 - 183.3 incentives for pricing efficiency and tariff restructuring; and
 - 183.4 price stability.

Connection incentives

184. Our main reason for favouring maintaining the WAPC is the incentive it provides for GDBs to pursue new gas connections and grow throughput. Compared to electricity which is generally considered to be an essential service, particularly for residential gas demand consumers have more choice in respect of gas, because they can choose whether to use gas and electricity or only electricity for their energy supply.
185. We consider that the GDBs have the ability to influence the uptake and use of gas. For example GDBs could promote new connections through liaising with subdivision developers or by promoting gas to customers that may have a gas pipeline in their street but might not yet be connected. We consider that ensuring new connections are incentivised will be in the long-term interests of consumers by ensuring they

have the option to use gas, particularly if it may be a more cost-effective option for them. Growing the gas distribution customer base will also spread the costs over a larger number of consumers.

186. Concept Consulting's report on the relative long-term demand risks between electricity and gas networks, indicated that the discretionary nature of gas versus the essential nature of electricity has been reflected in rates of customer connection/disconnection to the respective networks.⁷² It found that there appears to be a much tighter correlation between electricity customer numbers and population growth than gas customer numbers and population growth. This suggests that electricity will continue to be supplied and used regardless of whether or not there is any incentive to promote it and market it, but the same does not apply for gas distribution as gas is a discretionary fuel.
187. Stakeholders are also supportive of maintaining the WAPC because it incentivises GDBs to promote gas consumption and new connections between resets.⁷³ Powerco suggested that gas is often a more cost-effective energy source than electricity, particularly for space and water heating, and so it would be in the best interests of consumers for GDBs to promote its use.⁷⁴ MGUG explained that generally distribution demand is growing which makes WAPC a logical choice for GDBs because they can aim to outperform the price-path.⁷⁵ GasNet is also supportive of the WAPC because it is already in place and understood by GDBs and is straightforward to audit and operate.⁷⁶

Incentives for efficient expenditure

188. A revenue cap would remove the quantity forecasting risk from GDBs and consumers but the risk of unexpected changes in demand would be borne by consumers. Under the WAPC the risk that demand differs from forecast during the regulatory period is borne by suppliers. Consumers are exposed to expected/forecast changes in demand both within-period and between periods. Both consumers and suppliers are exposed to the quantity forecasting risk. There have not been any significant problems raised with the CPRG forecasting for gas distribution, which suggests there is not a significant concern that the WAPC is creating incentives for under-investment for GDBs.

⁷² Concept Consulting's (on behalf of Powerco) submission on the gas pipeline stakeholder meeting "Relative long-term demand risk between electricity and gas networks" (27 January 2016).

⁷³ Powerco "Gas pipeline default price-quality path reset 2017" (28 January 2016); Powerco "Submission on the four emerging view papers (29 February 2016)" (24 March 2016); MGUG "Submission on emerging views on form of control paper: 29 February 2016" (24 March 2016); First State Investments "Input Methodologies Review: Form of Control" (24 March 2016)

⁷⁴ Powerco "Gas pipeline default price-quality path reset 2017" (28 January 2016), para 29.

⁷⁵ MGUG "Submission on emerging views on form of control paper: 29 February 2016" (24 March 2016), para 27.

⁷⁶ GasNet "Submission on DPP from 2017 for gas pipeline services, process and issues paper – Public version" (24 March 2016), para 8.

189. Powerco explained that under the WAPC method, the volume risk is borne by distributors rather than consumers. In its view, this is appropriate, as distributors are better able to manage day to day volume risk under normal operating circumstance by promoting gas.⁷⁷ Also, First State Investments stated that GDBs may differ from GTBs in that they have more influence over demand and more comfort with the risk associated with forecasting demand in a DPP reset process.⁷⁸ We consider that GDBs do have more influence over demand than GTBs. Gas transmission demand is subject to factors that are outside the suppliers control, such as global commodity prices, whereas GDBs can influence gas demand through working with retailers and liaising with subdivision builders to influence new gas connections.
190. We consider that for gas distribution suppliers are best placed to manage the within-period demand risk because they can promote gas and influence demand (including through prices they set). Suppliers also want to be exposed to the demand risk because they see the opportunity to outperform the price-path.

Incentives for pricing efficiency and tariff restructuring

191. Tariff restructuring has not been raised as an issue for GDBs. The same compliance issues (eg use of lagged quantities) would exist for GDBs if they wanted to restructure tariffs under the current WAPC design. However, we consider that it is unlikely that GDBs might restructure tariffs to the same extent that EDBs may want to. As First State Investment explained, they do not see a WAPC being a barrier to efficient pricing in the same way as was argued for EDBs. It said that the ability to store gas through the line pack of distribution networks means that introducing peak charging signals is less valuable in gas than electricity.⁷⁹
192. In its Consumer Energy Options report,⁸⁰ Concept suggested that different forms of control may alter gas network companies' incentives for how they structure prices and has the potential to result in more efficient outcomes – in terms of utilisation of the existing gas network - over the longer term. However, Concept also reported that there are currently different charging approaches by the different network companies for residential supply of gas. It suggested that the incentives on gas network companies from the current Part 4 price control regime may have had some influence on why the companies have adopted the pricing approaches they have. It suggested that throughput-based pricing significantly increases year-on-year revenue volatility for network companies under the WAPC for both the transmission and distribution companies, and that some companies may move to greater use of fixed

⁷⁷ Powerco "Gas pipeline default price-quality path reset 2017" (28 January 2016), para 31.

⁷⁸ First State Investments "Input Methodologies Review: Form of Control" (24 March 2016).

⁷⁹ First State Investments "Input Methodologies Review: Form of Control" (24 March 2016).

⁸⁰ Concept Consulting "Consumer Energy Options in New Zealand – 2016 Update" (7 March 2016).

prices to mitigate this volatility. It suggests that fixed charges may not promote efficient usage decisions because gas is a discretionary fuel for most customers.⁸¹

193. However, Concept also presented a graph showing that under the current WAPC Powerco has adopted a hybrid pricing structure. It explains that “the most efficient tariff for residential customers could be some form of hybrid structure whereby the proportion of costs recovered from fixed charges varies with the amount of gas consumed”, and gives Powerco’s approach as an example of this.⁸² Therefore, we do not think that the current implementation of the WAPC for GDBs dis-incentivises GDBs from introducing efficient price structures.

Price stability

194. The WAPC will mean greater price stability within the period for consumers than a revenue cap. However, customers will still face the risk of price volatility at the resets between periods. Conversely, under a revenue cap, price volatility may be greater within the period, but less volatile between periods.

Overall view of our reasons

195. In weighing up the above dimensions from which we considered the form of control for GDBs, we consider that the incentives on connections is important for gas distribution because gas is a discretionary fuel and without the additional incentive provided by a WAPC, new gas connections may be less likely to happen, which could prevent consumers choosing to use gas if they consider it to be a more efficient option for them. We also consider that the demand risk is better placed with GDBs because they have the ability to influence demand for gas distribution and therefore a WAPC is more appropriate. We have no evidence that current compliance arrangements are impeding tariff reforms.

Design of the WAPC for GDBs

196. We propose maintaining the same WAPC design as is currently in place for GDBs and continuing to use lagged quantities.
197. However, we propose amending the treatment of forecast of pass-through and recoverable costs to adopt the pass-through balance approach that is currently in place for EDBs under a WAPC. The 2015 EDB DPP reset allows an EDB to use a “demonstrably reasonable forecast” of pass-through and recoverable costs in its price setting. Forecast error is washed out in subsequent years through a running account of the balance of costs and their recoveries. The current GDB DPP does not allow a forecast of pass-through and recoverable costs to be taken into account. A cost must be “ascertainable” which effectively means that there must be an audit

⁸¹ We consider that the use of fixed charges is not necessarily inefficient but it is the level of the fixed charges that may cause a problem and could lead to customers disconnecting.

⁸² Concept Consulting “Consumer Energy Options in New Zealand – 2016 Update” (7 March 2016), p.52.

trail to an invoice, a local authority rates notice or similar source document for the cost to be taken into account when pricing.

198. An advantage of this suggested change is that pass-through and recoverable costs would be more accurately reflected in prices earlier than in the current regime.

Chapter 5: RAB indexation and inflation risk – EDBs and GPBs

Purpose of this chapter

199. This chapter addresses issues raised by EDBs and GPBs about their exposure to inflation risk in relation to our approach of indexing the RAB, and how this approach protects the regulatory value of suppliers' investment in real terms.

Structure of this chapter

200. This chapter begins by summarising the issues raised by submitters relating to RAB indexation and inflation risk for EDBs and GPBs. It then explains why we do not consider these issues amount to a problem, and, as such, we do not propose to make any changes in this area.
201. Please refer to Attachment A for a stylised explanation of RAB indexation, including worked examples.

Issues raised by suppliers

202. There are three main issues that suppliers raised in submissions:
- 202.1 a lack of understanding of the impact of RAB indexation under different inflation scenarios;⁸³
 - 202.2 a fundamental disagreement that we should target real FCM rather than nominal returns;⁸⁴
 - 202.3 a view that EDBs are exposed to inflation risk which they cannot manage. This risk materialises when forecast and outturn inflation differ, which results in suppliers under/over recovering their efficient costs.⁸⁵
203. Attachment A aims to explain and clarify how RAB indexation to inflation works, and what the impact is on returns and exposure to inflation risk. Effectively, our approach results in a revenue/price-path that includes a real return on capital with the revaluation of the RAB providing the compensation for inflation over the period.
204. As we explain in this chapter and Attachment A, we do not consider the other two issues raised to be problems, and therefore do not propose to make any IM changes in response.

⁸³ See for example ENA's submission on the problem definition paper "Response to the Commerce Commission's input methodologies review paper" (21 August 2015), para 100.

⁸⁴ Vector "Input methodologies review – Update paper on the cost of capital topic" (9 February 2016), para 5.

⁸⁵ Vector "Submission to Commerce Commission on the Default Price-Quality Paths from 1 April 2015: Process and issues paper" (30 April 2014), para 6.

How stakeholders have articulated the issues

205. A number of stakeholders submitted on these issues. Below we include a number of quotes from submitters to illustrate the issues as they see them.

206. The ENA summarised the issue as follows:

The relationships between WACC, indexation of the asset base, CPI forecasting and DPP price setting are complex and some parties consider the current balance to be inappropriate. It would be useful for the IM review to consider the allocation of risk arising from the current settings.

The problem definition paper suggests that changes in WACC due to changes in inflation expectations would be broadly offset by changes in the forecast of asset revaluations. As a first step we suggest the Commission publish a worked example to support its view that there is a natural hedge at present as the effects of actual inflation differing from forecast will apply in different directions to different building block items, potentially offsetting each other. A worked example would help promote a common understanding of the issue and would be a useful basis for the debate.⁸⁶

207. Vector, during the 2015-2020 DPP reset, expressed it as:

Inflation is outside the control or influence of EDBs. In our view there is no reason for EDBs to be exposed to the forecast inflation risk that is associated with revaluations as they cannot take steps to mitigate it...Where actual inflation is lower (or higher) than the forecasts used when setting the starting price for the regulatory period, the revenue adjustment embedded in starting prices (and therefore reflected in each subsequent year's actual revenues) will not be equivalent to the revenue uplift based on the indexed RAB in future regulatory periods. This means that FCM will not be achieved.⁸⁷

208. More recently, Vector's February 2016 submission on the WACC update paper says:

Vector does not support the Commission's position that the WACC is a "natural hedge" to the forecast indexation of the RAB as this only supposedly delivers a real return. The IMs must have as their purpose and deliver in their application a nominal return to businesses, free of inflation forecasting errors... Vector supports "option 2" in Table 1 of CEG's expert report [no indexation nor revaluations treated as income] as being the most effective and least costly method of ensuring regulated businesses achieve a nominal return free of inflation forecasting errors.⁸⁸

⁸⁶ ENA's submission on the problem definition paper "Response to the Commerce Commission's input methodologies review paper" (21 August 2015), para 99, 100.

⁸⁷ Para 6 and 7 here: <http://www.comcom.govt.nz/dmsdocument/11824>

⁸⁸ Vector "Input methodologies review – Update paper on the cost of capital topic" (9 February 2016), para 5.

209. PwC, in a report for Vector, said:

The use of CPI forecasts to determine the revaluation rate used in setting the price-path means that EDBs and GPBs are exposed to inflation risk. If outturn inflation differs from that forecast, EDBs/GPBs may over- or under-recover an efficient level of costs.⁸⁹

210. CEG, in its February 2016 report commissioned by the ENA said:

This creates a potential for a material mismatch between the nominal cost of capital inputted into the Commission's financial model... and the final nominal compensation....⁹⁰

We do not consider these issues amount to a problem requiring IM changes

211. In relation to RAB indexation and inflation risk, we agree that there is a lack of understanding of:

211.1 our policy intent;

211.2 our approach to implementation; and

211.3 the outcomes that our approach produces.

212. We consider that no change is needed, just further explanation, which we provide in this chapter and Attachment A.

213. We have sought advice from Dr Martin Lally, who agrees that our approach and the outcome it delivers is consistent with our policy intent, which is ensuring that the way we set and reset price-quality paths is consistent with our real FCM principle (which is sometimes referred to as 'NPV = 0').⁹¹ As is explained in our Framework paper, this principle is that regulated suppliers should have the opportunity to maintain their financial capital in real terms over timeframes longer than a single regulatory period.⁹²

214. Overall, Dr Lally concludes that:

RAB indexation in conjunction with the Commission's price path adjustment does not violate the NPV = 0 principle. In addition the collective effect of these two adjustments is to preserve both the real output price paid by consumers and that

⁸⁹ PWC "A wash-up mechanism for the DPP revaluation rate: A report prepared for Vector" (April 2014), p. 2. Available here: <http://www.comcom.govt.nz/dmsdocument/11823>

⁹⁰ CEG "Inflation: Revaluations and revenue indexation" (report prepared for ENA, February 2016), para 12. Available here: <http://www.comcom.govt.nz/dmsdocument/14069>

⁹¹ We intend to further assess the interaction between CPI indexation of the price path and the RAB, and the impact on real returns for different inflation scenarios. We welcome stakeholders' views on this interaction.

⁹² Commerce Commission "Input methodologies review draft decisions: Framework for the IM review" (16 June 2016), paras 124-128

received by the businesses over all periods, and therefore insulate them from inflation risks. The only downside is to expose the businesses to some additional bankruptcy risk, but this would be slight.⁹³

215. Attachment A clarifies these three areas. In short:

215.1 Our policy intent in the IMs is to provide suppliers the expectation of real FCM. Where our forecasts (including of the CPI) are unbiased, we are clear that real FCM is expected on an ex-ante basis; and

215.2 For EDB/GPBs, our approach to RAB indexation offers an ex-ante expectation of a real return (or real FCM), and delivers an ex-post real return (or real FCM) but not in nominal terms (unless actual inflation equals forecast inflation). This results in an outcome where both consumers and suppliers are protected from inflation risk. However, to the extent that suppliers issue nominal debt, they may be exposed to a likely small bankruptcy risk when outturn inflation is lower than forecast. This is because total nominal returns are lower, and interest payments to debt holders tend to be fixed in nominal terms when nominal debt is issued.

216. We agree that inflation is outside suppliers' control. However, our approach to RAB indexation for EDBs and GPBs protects them (and their consumers) from inflation risk by *delivering* real returns all other things being equal. Therefore, real FCM is maintained. Furthermore, we consider that the residual bankruptcy risk associated with the issuance of nominal debt is small, with an underlying symmetric driver (ie, actual inflation can be above or below forecast)⁹⁴ so it is likely that suppliers can either bear it, or efficiently manage it (eg, by issuing inflation-indexed debt).

217. We consider that suppliers' claims that they may over or under-recover when inflation outturn and forecast differ suggest that real FCM should not be our underlying principle.⁹⁵ We consider that our approach ensures that they are made whole in real terms, which is more consistent with expectations in a workably competitive market.⁹⁶

⁹³ Dr Lally's expert advice on the cost of debt, asset beta adjustments for GPBs, RAB indexation and inflation risk, and TAMRP "Review of further WACC issues" (report to the Commerce Commission, 22 May 2016), section 3. Dr Lally's advice also covers our approach whereby we index the actual price path to a lagged measure of outturn inflation.

⁹⁴ Bankruptcy is not a symmetric matter.

⁹⁵ We note that Powerco appears to agree with us when it notes: "Applying the DPP WACC together with the associated forecasts of inflation would leave intact the natural hedge for inflation that the Commission has observed is present in the current arrangements... Powerco submits that that the IMs could be amended to set out the objective to be achieved (ie, the use of an inflation assumption in revenue and the RAB that is consistent with the DPP WACC, so that the implicit inflation hedge is preserved...". Source: Powerco "Re: Scope and process for fast track amendments to the CPP input methodology requirements" (23 June 2015), para 34.

⁹⁶ For example: "**No commercial competitor would come into an industry if they did not expect to be able to recover the decline in real values of their assets, as well as earn a normal profit (the opportunity cost**

218. Here is how we see the impact of inflation on revenues and RAB revaluations, which make up total returns (see Table A1 in the Attachment A):

218.1 revenues: when outturn inflation is lower (higher) than forecast, their nominal revenues are unchanged, while their real revenues are higher (lower); and

218.2 RAB revaluations: when outturn inflation is lower (higher) than forecast, RAB revaluations are lower (higher) by an equal amount but in opposite direction to the change in real revenues.

219. Because the expected revaluation gains are deducted from allowed income in setting the price-path, the result is that the revenue/price-path effectively includes a real return on capital with the revaluation of the RAB providing the compensation for inflation over the period. CEG, explained our approach as follows:

The IMs deliver a return on capital that is equal to the real cost of capital estimated at the beginning of a DPP/ CPP - with actual nominal compensation arrived at by adding actual outturn inflation over the DPP/ CPP period to the estimated real cost of capital at the beginning of the DPP/ CPP period.⁹⁷

We are not proposing any changes in this area

220. We have not identified any problems in relation to our approach. Therefore, in our judgement, no change is needed to our existing approach to RAB indexation for EDBs and GPBs.

221. We have not yet heard a compelling reason why we should change our policy intent from targeting ex-ante real FCM to targeting nominal returns. We continue to consider that providing an expectation of, and delivering (all else equal), real FCM promotes incentives to invest (consistent with section 52A(1)(a)). This approach protects the regulatory value of suppliers' investment in real terms.

222. Furthermore, as presented in Attachment A, our current approach to RAB indexation, as provided for in the IMs, is consistent with our policy intent. It effectively delivers real FCM, protecting consumers and suppliers from inflation risk.

223. The only potential problem with the current arrangements is the bankruptcy risk. We consider this risk is probably small given both the low inflation environment (which means it is unlikely for inflation to drop much lower), and suppliers ability to bear or

of capital). They would measure their return in investment after recovery of funds sufficient to maintain the real value of the **financial capital** they had invested" HM Treasury Advisory Group, Accounting for Economic Costs and Changing Prices: a report to HM Treasury by Advisory Group, Vol. 1, HMSO, London, 1986, para 19 (emphasis in original).

⁹⁷ CEG "Inflation: revaluations and revenue indexation" (February 2016), para 9.

mitigate it (eg, by issuing inflation-indexed debt). Therefore, we consider that it does not warrant an IM change. In this respect, Dr Lally concludes that:⁹⁸

this methodology exposes businesses to some bankruptcy risk when inflation is lower than forecast, because the interest payments to debt holders are fixed in nominal terms. Nevertheless, the Commission's inflation forecast errors are likely to be uncorrelated over time and therefore will tend to offset over time. Furthermore, inflation in New Zealand has low variability. So, the bankruptcy risk to businesses is slight.

⁹⁸ Dr Lally's expert advice on the cost of debt, asset beta adjustments for GPBs, RAB indexation and inflation risk, and TAMRP "Review of further WACC issues" (report to the Commerce Commission, 22 May 2016), section 3.

Chapter 6: RAB indexation and inflation risk - Transpower

Purpose of this chapter

224. This chapter explains the issues we identified in relation to Transpower's exposure to inflation risk and the time profile of capital recovery. It also discusses one potential problem we have identified with our current approach to inflation risk for Transpower, and our proposed solution.

Structure of this chapter

225. This chapter begins by summarising the issue we identified relating to RAB indexation and inflation risk for Transpower and its customers, and why we are not proposing to make any changes to Transpower's indexation approach. It then describes a potential problem we have identified with maintaining this approach, and our proposed solution.

We considered whether we should index Transpower's RAB to inflation

226. Stakeholders have not raised problems with the approach to inflation risk that applies under the current IMs for Transpower. However, we identified and considered the following issue.

Time profile of capital recovery

227. Our lack of indexation of Transpower's RAB means that capital recovery is front-loaded relative to an indexed approach (as applied to the EDBs). We considered this was appropriate in 2010 given their relatively large investment programme, since an un-indexed approach would likely lead to higher revenues in the near term that better matched their investment needs. We signalled that we would re-consider the arrangement in the future once their major investment tranche came to an end. This has now happened.

We are not proposing to change the IMs to index Transpower's RAB to inflation

228. On balance, we propose to maintain the current approach, whereby we do not index Transpower RAB to inflation. We have not identified any problems in relation to our approach and we are not aware of a compelling enough reason that warrants a change to the status quo.

229. If we were to change our approach there would be complexity and compliance costs of an unknown magnitude, given Transpower's regulatory approach relies heavily on consistency with GAAP to the extent practicable, and indexing the RAB would not be able to be achieved in a GAAP consistent manner. We also considered the possible revenue shock RAB indexation could cause.⁹⁹

⁹⁹ For an assumed inflation forecast range of 1-3% and given Transpower's RAB of around \$4.5bn, our indicative estimate is that revenue could decline by around \$45m to \$135m annually compared to the

230. The uncertainty around capital recovery resulting from emerging technologies means that indexing Transpower's RAB is not consistent with our approach to shortening asset lives for EDBs. To be consistent we would have to allow an equivalent treatment for Transpower, but this would add complexity for a similar outcome to that achieved under no RAB indexation.
231. We consider that these reasons justify maintaining a different approach than for EDBs.
232. As with all proposals presented in this paper, we welcome stakeholders' views on this.

Inflation risk

233. Although we propose to maintain our current approach for Transpower—which is not indexing its RAB to inflation—we consider that there is a potential improvement we could make to this approach. All other things being equal, the current approach delivers ex-post nominal returns, which exposes both consumers and Transpower to the risk that outturn inflation differs from the inflation expectation inherent in the nominal WACC used.

Possible change to deliver real FCM ex-post

234. Our proposed change is to protect both consumers and Transpower from inflation risk by delivering real FCM ex-post all else equal, consistent with our approach to EDBs and GPBs. We propose to create an annual capital charge adjustment through the MAR wash-up.
235. The adjustment would be equal to the difference between the actual less forecast inflation rate, multiplied by the opening RAB. Since the forecast inflation is a proxy for the inflation expectation inherent in the nominal WACC, the forecast to use should be the one produced at the same time as when the nominal WACC is calculated.
236. This is our proposed solution and we have drafted changes in Transpower's draft Determination to show how this solution might be implemented. We consider this change would better promote incentives to invest, consistent with s 52A(1)(a). However, we are open to maintaining the status quo because we consider the net benefits of the proposed change may be relatively small, since inflation forecast errors are likely to be uncorrelated and inflation has low variability in New Zealand.

current approach. The RAB would be revalued by this same amount (where outturn inflation equals forecast).

Attachment A: RAB indexation worked examples

237. The purpose of this attachment is to:

- 237.1 provide some simple examples to illustrate how our choice of approach regarding RAB indexation and revaluations expose suppliers' to inflation risk, or how it protects the regulatory value of suppliers' investment in real terms; and
- 237.2 note some of the submissions we have received on what the appropriate returns target should be – real or nominal.

A simple illustrative example of real vs nominal returns

238. Consider two bank savings accounts. Savings account A promises an 8% annual *nominal* interest rate (ie, it promises nominal returns) while savings account B promises an 8% *real* interest rate (ie, it promises real FCM or real returns). On 1 January 2016 I deposit \$100 in each account. Inflation during the year is 2%. In 31 December 2016 I look at my accounts and this is what I see:

- Savings account A: \$108 → So I earned \$8, but since inflation was 2%, my \$100 capital only increased by 6% in real terms (ie, real = nominal - inflation).¹⁰⁰ That is an 8% nominal return in an environment of 2% inflation.
- Savings account B: \$110.16 → I earned \$10.16, so my final capital of \$110.16 is 8% higher than the inflation-adjusted value of my initial capital – \$102. That is an 8% real return in an environment of 2% inflation.

239. What would happen if instead of 2% inflation we had 0% inflation? Well, both savings accounts would have \$108 in 31 December 2016. This is because the real and nominal interest rates are equal when inflation is zero.

Our approach to EDBs and GPBs both allows an expectation of and delivers real FCM

240. Our implementation of RAB indexation provides an *ex-ante* expectation of real returns (or real FCM), and delivers an *ex-post* real return.

241. Our price setting process at the time of resetting price paths is as follows:

1. WACC: use a nominal WACC (which inherently incorporates inflation expectations at the time it is calculated);
2. Forecast RAB revaluations: forecast inflation for each year of the regulatory period, then annually revalue the RAB by the forecast inflation;

¹⁰⁰ Formally, the Fisher equation gives the relation between real and nominal interest rates: $1+i = (1+r)(1+\pi_e)$, where i and r are the nominal and real interest rates respectively, and π_e is the expected inflation. However, for readability we have simplified the illustrative examples in this attachment.

3. Forecast revaluations as income: deduct the forecast annual RAB revaluation (based on forecast CPI) from the annual allowed revenue (ie, revaluations treated as income). This ensures that EDBs are not compensated for inflation twice (ie, once by the use of a nominal WACC, and twice by revaluing the RAB);
4. RAB roll forward: under ID, the RAB is revalued using actual rather than forecast inflation. Therefore, at the time of the next price reset, opening RAB values have been maintained in real terms.

242. We considered CEG's example to see if our approach adheres to the principle of real FCM:

"Let there be a one year regulatory period and a perpetual (non-depreciating) asset in the RAB with a value of \$100. Let the nominal WACC be 8% and let forecast inflation be 2% over the regulatory period and let the tax rate be zero. In this stylised example allowed revenues generated by this asset will be \$6 – comprised on 8% return on \$100 less 2% (\$2) forecast revaluation.

If inflation turns out to be 2% then the asset owner will receive an actual \$2 revaluation of their asset at the end of the one year regulatory period. Consequently, their total return comprising both revenues within the regulatory period and revaluation at the end of it will be equal to the 8% estimated cost of capital at the beginning of the regulatory period (6% in the form of revenues and 2% in the form of revaluation).

However, if actual inflation turns out to be 0% then the asset owner will receive 0% actual revaluation under the IMs at the beginning of the next regulatory year. Consequently, **the asset owner's nominal return will be 6% and not the estimated 8% at the beginning of the previous regulatory year. Similarly, if actual inflation turns out to be 4% then the asset owner will receive nominal compensation of 10% (6% in revenues and 4% in revaluations)** [emphasis added]."¹⁰¹

243. CEG's example is correct. Fundamentally, that is how our price setting approach works – ie, it delivers a real return. Table A1 below demonstrates this by showing the real and nominal impact of inflation shocks on the components that make up owners' total returns (ie, revenue and capital gains in the form of RAB revaluation).

¹⁰¹ CEG "Inflation: revaluations and revenue indexation" (February 2016), paras 6-8.

Table A1: Stylised breakdown of returns at end of regulatory period in CEG's example

<i>Opening RAB = \$100 Nominal WACC = 8%</i>	Forecast $\pi = 2\%$ Outturn $\pi = 2\%$	Forecast $\pi = 2\%$ Outturn $\pi = 0\%$	Forecast $\pi = 2\%$ Outturn $\pi = 4\%$
Nominal revenue ¹	\$6 (or 6%)	\$6 (or 6%)	\$6 (or 6%)
Real revenue ¹	\$4 (or 4%)	\$6 (or 6%)	\$2 (or 2%)
Actual RAB revaluation ²	\$2 (or 2%)	\$0 (or 0%)	\$4 (or 4%)
Total nominal return	\$8 (or 8%)	\$6 (or 6%)	\$10 (or 10%)
Total real return	\$6 (or 6%)	\$6 (or 6%)	\$6 (or 6%)

Notes: π denotes inflation; 1 - includes forecast revaluations treated as (ie, deducted from) income; 2 - revaluations based on outturn inflation applied at the end of the period to the closing RAB in the RAB roll forward equation. Real and nominal revaluations are equal because they are applied at the end of period 1, so before the impact of period 2's inflation.

244. Let's consider the emboldened text in CEG's example: when inflation is 2%, the real return is 6%; when inflation is zero, the real return is also 6% (which equals the nominal return); and when inflation is 4%, the real return is also 6%.
245. In this example, an ex-ante normal return in real terms is one which equals the real WACC. The real WACC in the example is 6%.
246. If the owner received an 8% nominal return when inflation was zero, which is what CEG's example seems to imply should happen, then it would be earning 2% above-normal returns in real terms. Similarly, if the owner received an 8% nominal return when inflation was 4%, then it would be earning 2% below-normal returns in real terms. This would violate the principle of real FCM.
247. CEG, considers that our approach:
- “creates a potential for a material mismatch between the nominal cost of capital inputted into the Commission's financial model and the final nominal compensation provided”.¹⁰²
248. And that's right – there may be a nominal mismatch, but there is a 'real match'.
249. Therefore, we can characterise our implementation of RAB indexation as providing an ex-ante expectation of a real return (or real FCM), and delivering an ex-post real return.

¹⁰² CEG “Inflation: revaluations and revenue indexation” (February 2016), para 12.

250. It is worth clarifying one of Dr Martin Lally’s conclusions in its February 2016 advice, which conveniently uses a very similar example to CEG:

“inflation shocks in the first regulatory cycle do not affect nominal revenues in the first cycle but raise [in the case of a positive inflation shock] subsequent revenues in proportion to the inflation shock. However, in real terms, **REV₁ is down and REV₂ is unchanged** [emphasis added].”¹⁰³

251. The reader may wonder how real FCM can be reconciled with the emboldened text, which could be interpreted as suggesting that real FCM may be breached since, in real terms, period 1 revenue is down and period 2 revenue is unchanged.
252. The key is to realise that, in this example of a positive inflation shock, the *total returns* (ie, revenue *plus* RAB revaluation) to the owner at the end of the regulatory period 1 are maintained in real terms. The last column of the above table shows this: while the real revenue at the end of period 1 is lower (\$2 instead of \$4), this is offset by a higher RAB revaluation based on outturn inflation of \$4 (instead of \$2). This delivers a real return of \$6. Furthermore, the higher opening RAB value for period 2 maintains the ex-ante expectation of normal returns going forward.

Our approach to EDBs and GPBs may expose them to bankruptcy risk

253. This happens when inflation is lower than forecast and to the extent that suppliers issue nominal debt. This is because total nominal returns are lower, and interest payments to debt holders tend to be fixed in nominal terms when nominal debt is issued. Lally explains:

“this methodology exposes businesses to some bankruptcy risk when inflation is lower than forecast, because the interest payments to debt holders are fixed in nominal terms. Nevertheless, the Commission’s inflation forecast errors are likely to be uncorrelated over time and therefore will tend to offset over time. Furthermore, inflation in New Zealand has low variability. So, the bankruptcy risk to businesses is slight.”¹⁰⁴

¹⁰³ Dr Lally’s expert advice on the cost of debt, asset beta adjustments for GPBs, RAB indexation and inflation risk, and TAMRP “Review of further WACC issues” (report to the Commerce Commission, 22 May 2016), section 3.

¹⁰⁴ Dr Lally’s expert advice on the cost of debt, asset beta adjustments for GPBs, RAB indexation and inflation risk, and TAMRP “Review of further WACC issues” (report to the Commerce Commission, 22 May 2016), section 3.

254. CEG’s view is different to Lally’s judgement that our inflation forecast errors are likely to be uncorrelated over time and therefore will tend to offset over time. CEG, considers that:

“In this context, it is reasonable to expect that investors perceive an asymmetry in the probability that inflation will be above/below the RBNZ’s target, at least in the medium term... there is more downside than upside risk to inflation.”¹⁰⁵

Our approach to Transpower allows an expectation of real FCM but delivers nominal returns

255. Our price setting process for Transpower at the time of resetting price paths is as follows:

1. WACC: use a nominal WACC (which inherently incorporates inflation expectations at the time it is calculated);
2. RAB revaluations: not applied;
3. Revaluations as income: not applied;
4. RAB roll forward: inflation has no role in rolling forward Transpower’s RAB.

256. A consequence of this approach is that Transpower’s returns are maintained in *nominal* terms ex-post. They are only maintained in real terms when the inflation expectations inherent in the nominal WACC equal outturn inflation. Using the same example as before, the table below shows this:

Table 2: Stylised breakdown of Transpower’s returns at end of regulatory period

<i>Opening RAB = \$100 Nominal WACC = 8%</i>	Expected $\pi = 2\%$ Outturn $\pi = 2\%$	Expected $\pi = 2\%$ Outturn $\pi = 0\%$	Expected $\pi = 2\%$ Outturn $\pi = 4\%$
Nominal revenue	\$8 (or 8%)	\$8 (or 8%)	\$8 (or 8%)
Real revenue	\$6 (or 6%)	\$8 (or 8%)	\$4 (or 4%)
Actual RAB revaluation	N/a	N/a	N/a
Total nominal return	\$8 (or 8%)	\$8 (or 8%)	\$8 (or 8%)
Total real return	\$6 (or 6%)	\$8 (or 8%)	\$4 (or 4%)

Notes: π denotes inflation. I use the term “expected” instead of “forecast” since we do not use explicit inflation forecasts for Transpower, but rather a nominal WACC that has inherent inflation expectations in it.

¹⁰⁵ CEG “Inflation: revaluations and revenue indexation” (February 2016), para 35.

257. Therefore, we can characterise Transpower’s regime as providing an ex-ante expectation of a real return (or real FCM)¹⁰⁶, and delivering an ex-post nominal return.
258. Referring to the approach we apply to Transpower, Lally concludes that “Following the same type of analysis presented above, it can be shown that this too does not violate the NPV=0 principle.”
259. NPVs are forward-looking and therefore deal with expected future outcomes rather than their actual outcomes. Therefore, it is consistent to say that the Transpower regime provides an ex-ante expectation of a real return and that it does not violate the ex-ante NPV=0 principle, even though it delivers an ex-post nominal return that may differ from the NPV=0 expectation.¹⁰⁷

Should the IMs provide an ex-ante expectation of real FCM or nominal returns?

260. This section presents our view when setting the IMs in 2010, and some extracts from different stakeholders on the topic.

Our current view – expectation of real FCM

261. The IM reasons paper for EDBs and GPBs states that our policy is to offer suppliers the expectation of real FCM:

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

...it is important to reiterate that, in the context of price-quality regulation, FCM is applied on an *ex ante* basis.¹⁰⁸

¹⁰⁶ This is because the approach delivers a real return when expected and outturn inflation are equal.

¹⁰⁷ An ex-post nominal return is equivalent to ex-ante NPV=0 only when expected and outturn inflation are equal.

¹⁰⁸ IM reasons paper for EDBs and GPBs, para 2.6.28.

262. In relation to inflation risk, later in the same reasons paper we say:

“FCM requires that regulated suppliers are compensated for the impact of economy-wide inflation over time.”¹⁰⁹

263. In 2010, Vector agreed with our policy intent and indexation approach for EDBs and GPBs:

“The Commission's draft decision is that CPI indexation, when combined primarily with straight line depreciation, is the best method of revaluing the RAB as it meets the Part 4 Purpose Statement.

Vector accepts the Commission's proposal as a reasonable method of rolling forward the RAB. Specifically, Vector considers that the proposed approach is:

(a) consistent with suppliers receiving a relatively smooth real return on capital from the RAB in each period, which assists meeting 52A(1) (a), (b) and (d);

(b) consistent with attaining allocative efficiency, which assists meeting 52A(1)(b);

(c) reflective to some extent of changes to replacement costs and productivity in the economy as a whole, which assists meeting 52A(1) (a), (b) and (d); and

(d) consistent with smaller price shocks to consumers when assets need to be replaced, which assists meeting 52A(1)(c).¹¹⁰

264. Our reasons for EDBs and GPBs indexed approach were:

“Where regulators are attempting to limit a regulated supplier’s profits to close to a normal return, revaluation gains (and losses) will need to be taken into account for **consistency with FCM**. This is why the revaluation gains (or losses) that are in the roll forward equation (paragraph 2.8.11) are netted off (or added to) the building blocks allowable revenue (paragraph 2.8.10). Doing so is **consistent with a workably competitive market, in which returns are provided by both income and growth (ie, capital gains)**. Capital gains themselves reflect an expectation of higher cash-flows in the future, either through expected cash-flows from revenue generated by employing assets to supply services, and/or through the sale of those assets.

Maintaining FCM in this manner will provide incentives for investment, consistent with s 52A(1)(a), while **limiting excessive profits**, consistent with s 52A(1)(d). Nevertheless, it is important to reiterate that, in the context of price-quality regulation, FCM is applied on an *ex ante* basis. Allowing regulated suppliers the opportunity to achieve a higher levels of profits over the short to medium term as a reward for efficiency gains, provides the incentives for those gains to be made in the first place, consistent with s 52A(1)(b). Those efficiency gains are then shared with

¹⁰⁹ IM reasons paper for EDBs and GPBs, para 2.8.14.

¹¹⁰ Vector “Submission in response to the Commerce Commission’s Draft Reasons Paper for Electricity Distribution Businesses and Gas Pipeline Businesses: Asset Valuation” (23 August 2010), paras 216, 217

consumers, consistent with s 52A(1)(c), when the price-path is reset at the end of each regulatory period (paragraphs 2.7.3-2.7.4)."¹¹¹

265. In Transpower's case, we explain the reasons for preferring an un-indexed approach as follows:

"Transpower should continue to value its RAB using an un-indexed approach under Part 4. No indexation will be applied. The Commission considers an un-indexed approach is appropriate for Transpower for the following reasons [we formatted the below reasons for brevity and clarity]:

- **[Large investment programme];**
- **[Age structure of asset base means an un-indexed approach likely to lead to higher revenues in the near term. That better matches the investment needs].**

Some of the above factors might be more relevant over the short to medium term than over the long-term (eg, because of Transpower's current tranche of investment). In the case of EDBs, the Commission considers the greater protection against inflation risk that is afforded by CPI-indexation is sufficient reason to prefer such an approach over an un-indexed approach. In Transpower's case this factor is currently outweighed by the factors discussed above. In the longer term, some of the differences between Transpower and EDBs might become less significant, in which case consideration of greater alignment in some of the approaches for electricity distribution services and electricity transmission services might be warranted.

In the longer term, after the current tranche of investment comes to an end, moving to a CPI-indexed approach, consistent with the other sectors regulated under Part 4, may be appropriate."¹¹²

266. In the past, Jeff Balchin (acting for Powerco) has argued for an indexed approach:

"An important objective of inflation indexation in a CPI-X regime is to protect investors in long-lived assets from the risk of inflation being higher or lower than forecast. This implies that the same real return must be expected, irrespective of the level of inflation that is observed."¹¹³

¹¹¹ IM reasons paper for EDBs and GPBs, para 2.8.17, 2.8.18.

¹¹² IM reasons paper for Transpower paras 4.3.12 – 4.3.15.

¹¹³ PWC "2010-2015 default Price-Quality Path Starting Price Adjustments Update Paper: Importance of the Forecast of Inflation" (13 May 2011), page 1. Available here: <http://www.comcom.govt.nz/dmsdocument/518>

267. An older NERA report also articulates the advantages (or necessity) of real FCM:

“As Byatt et al. explain: “Investors will want to calculate the real rate of return after the maintenance of the real value of their capital for comparison with returns available elsewhere.”¹¹⁴

FCM therefore provides the standard by which investors effectively measure whether the regulatory regime is allowing them to recover their costs including a rate of return comparable with that offered by other companies and sectors...Similarly, regulators must ensure that the rate of return they allow regulated companies to earn is consistent with the FCM standard. The 1986 Byatt Report recognised that **investors would only expect to recover their costs if the allowed rate of return is sufficient to cover the cost of capital and after maintaining the real financial value of their investments: “No commercial competitors would come into an industry if they did not expect to be able to recover the decline in real values of their assets, as well as earn a normal profit (the opportunity cost of capital). They would measure their return on investment after recovery of funds sufficient to maintain the real value of the financial capital they had invested.”**¹¹⁵

This extract sets out certain conditions for entry into competitive markets. Those conditions apply equally to regulated businesses, which must offer a rate of return comparable to that in other sectors, in order to attract capital into the sector. **The compensation for investment must cover all declines in the real value of the assets, whether caused by depreciation of the asset or by revaluations at less than the rate of inflation.**¹¹⁶ FCM is the appropriate way to measure depreciation and profits, so as to achieve this aim.¹¹⁷

268. In its latest February 2016 submission, Vector seems to argue for both an ex-ante expectation and an ex-post delivery of nominal returns:

“The IMs must have as their purpose and deliver in their application a nominal return to businesses, free of inflation forecasting errors... Vector supports “option 2” in Table 1 of CEG’s expert report [no indexation nor revaluations treated as income] as being the most effective and least costly method of ensuring regulated businesses achieve a nominal return free of inflation forecasting errors.”¹¹⁸

¹¹⁴ Byatt et al., “Accounting for Economic Costs and Changing Prices”, Volume 1, HMSO, 1986, para 87.

¹¹⁵ Byatt et al., “Accounting for Economic Costs and Changing Prices”, Volume 1, HMSO, 1986, para 19.

¹¹⁶ By recovering “decline in real values of their assets”, investors are effectively maintaining the real value of their capital, since they receive cash from revenues in exchange for depreciation of asset values. This principle is effectively a definition of a property right akin to the rights underlying US regulatory practice and law.

¹¹⁷ http://www.ceer.eu/portal/page/portal/ERGEG_HOME/ERGEG_PC/ARCHIVE1/GAS/Principles%20gas%20tariff%20calculation/GTS.pdf

¹¹⁸ Vector “Input methodologies review – Update paper on the cost of capital topic” (5 February 2016), paras 5, 6.

269. CEG, in its February 2016 report to the ENA, argues that the decision on whether to provide an expectation of real or nominal returns depends on our view of what are businesses' efficient funding practices. They say that if we consider it efficient that suppliers issue nominal debt, then the objective should be to deliver nominal returns:

“Whether any amendment to the role of forecast inflation in the IMs is appropriate depends on whether the objective is to deliver a target real or a target nominal return to regulated businesses. In our view this, in turn, depends on how businesses are assumed to efficiently fund their investments. Moreover, the answer may be different for that part of the RAB funded by debt to that part of the RAB funded by equity.”¹¹⁹

270. Regarding equity remuneration, CEG, considers that it does not matter whether we target a real or nominal return, since a business does not enter into any binding contract to deliver a specified return (real or nominal):

“there are no assumed contractual obligations for the model of regulatory compensation to mirror. It is therefore ambiguous if the compensation for the cost of [equity] should target a nominal or a real return.”¹²⁰

¹¹⁹ CEG “Inflation: revaluations and revenue indexation” (February 2016), para 35.

¹²⁰ CEG “Inflation: revaluations and revenue indexation” (February 2016), para 28.