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Input methodologies review decisions

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

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20 December 2016	1178-2560	*Electricity Distribution Services Input Methodologies Amendments Determination 2016* [2016] NZCC 24
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20 December 2016	1178-2560	*Gas Transmission Services Input Methodologies Amendments Determination 2016* [2016] NZCC 26
20 December 2016	1178-2560	*Transpower Input Methodologies Amendments Determination 2016* [2016] NZCC 27
20 December 2016	1178-2560	*Airport Services Input Methodologies Amendments Determination 2016* [2016] NZCC 28
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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 solutions to these problems;

X1.3 the reasons for our 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 have decided that non-exempt electricity distribution businesses will be regulated under a revenue cap rather than a weighted average price cap (**WAPC**). This will remove the quantity forecasting risk, and therefore any potentially detrimental effect of that risk on EDBs' incentives to spend efficiently. The change to a revenue cap will 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 significant long-term benefits to consumers as a result of reforming the pricing of the services that EDBs deliver. The IMs do not contain specific requirements relating to pricing; however our decision 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 compliance barrier to EDBs restructuring pricing approaches. We recognise that this may also change other incentives on EDBs to restructure prices. The EA, whose responsibility includes distribution pricing, prepared a letter in which it elaborated on some of these other incentive effects and other evolving factors that may affect EDBs' incentives to reform prices. We published this letter as part of our draft decisions package of papers.

X5. We have decided to maintain a revenue cap for gas transmission businesses (**GTBs**) but to change the design to move to a pure revenue cap allowing for wash-up of over and under-recovery of revenue. We consider that changing from the pre-review 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 have decided to maintain a WAPC using lagged quantities for gas distribution businesses (**GDB**s). We consider that the incentive for connections are important for gas distribution businesses because gas is a somewhat more discretionary fuel and without the additional incentive provided by a WAPC, new gas connections may be less likely to happen. That could prevent consumers using gas if they considered it to be a more efficient option for them.

X7. In our draft decision, we considered changing the approach to forecasts of pass-through and recoverable costs to align with the pass-through balance approach used by EDBs. However, we have decided to maintain the existing 'ascertainable' approach for GDBs to minimise complexity and compliance costs.

X8. There have been no significant issues raised with having a revenue cap for Transpower, and we are not changing the form of control for Transpower.

X9. We have not identified any significant 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.

X10. 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. We previously considered the introduction of a mechanism to protect both Transpower and consumers from inflation risk through an 'annual capital charge adjustment'.[1] However we have not identified any significant problems in relation to our current approach and we are not aware of a compelling enough reason that warrants a change to the status quo.

X11. Table X1 summarises the areas in the form of control and RAB indexation topics where our analysis has led us to change the IMs. The issues that we have considered in relation to these topics that have not resulted in changes, are discussed as part of the following chapters in this paper.

[1] Commerce Commission "Input methodologies review draft decisions: Topic paper 1 – Form of control and RAB indexation for EDBs, GPBs and Transpower" (16 June 2016), para 234.

Table X1: Summary of changes in relation to this topic

Change	Outcomes of the change	Chapter
We have decided to change the form of control for EDBs from a lagged WAPC to a 'pure' revenue cap which includes a wash-up of over- and under-recoveries.	The outcomes of this change will be: • it will remove the quantity forecasting risk, and therefore any potentially detrimental effect of that risk on EDBs' incentives to spend efficiently; • it will remove potential compliance barriers for suppliers to restructure their tariffs to be more efficient (we consider that there are a mix of factors encouraging pricing efficiency,[2] which taken together, are likely to dominate over any potential diminished incentives to price efficiently under a revenue cap); and • it will remove a potential disincentive on suppliers to pursue energy efficiency and demand side management (**DSM**) initiatives. The change to a revenue cap may make prices more volatile within the regulatory control period.	Chapter 2
We have decided 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.	The outcomes of this change will be that: • 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; and • 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

[2] We note that some factors will positively encourage pricing efficiency but others may simply mean that any potential diminished incentives to price efficiently under a revenue cap do not hold in practice.

X12. This topic paper forms part of our package of decision papers on the input methodologies review (**IM review**). As part of the package of papers, we have also published:

X12.1 a summary paper of our decisions;

X12.2 an introduction and process paper which provides an explanation of how the papers in our decisions package fit together;

X12.3 a framework paper, which explains the framework we have applied in reaching our decisions on the IM review;

X12.4 a report on the IM review, which records our decisions on whether and how to change the IMs as a result of the IM review overall; and

X12.5 amendment determinations, which give effect to our decisions.

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 identified within these topic areas;

   1.2 our assessment of potential solutions to these problems;

   1.3 the reasons for our chosen 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 decisions papers

2. This topic paper forms part of our package of decision papers on the input methodologies review (**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 decisions package.[3]

3. This paper explains our solutions to problems identified within the topics of form of control and RAB indexation.

4. To the extent our solutions involve changes to the input methodologies (**IM**s), this paper explains how we have changed our pre-review IM decisions within these topic areas.[4] The Report on the IM review then collates our changes to those IMs and presents them as decisions to change the IMs.[5]

5. The drafting changes to the IMs, including those resulting from these topic areas, are shown in the amended determinations.[6]

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3 Commerce Commission "Input methodologies review decisions: Introduction and process paper" (20 December 2016).

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

5 Commerce Commission "Input methodologies review final decision: Report on the IM review" (20 December 2016).

6 Electricity Distribution Services Input Methodologies Amendments Determination 2016 [2016] NZCC 24; Gas Distribution Services Input Methodologies Amendments Determination 2016 [2016] NZCC 25; and Gas Transmission Services Input Methodologies Amendments Determination 2016 [2016] NZCC 26.

6. The framework we applied in reaching our decisions on the IM review is set out in a separate paper, also published alongside this paper.[7] The Framework paper explains that we have only changed the IMs where this is likely to:

   6.1 promote the Part 4 purpose in s 52A more effectively;

   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 decision on the form of control for electricity distribution business (**EDBs**) is s 54Q of the Commerce Act 1986 (**Act**), 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 this structure:

   9.1 description of the issue or problem; and

   9.2 explanation of our solution and our reasons for 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

[7] Commerce Commission "Input methodologies review decisions: Framework paper" (20 December 2016).

price-quality regulation.[8] This topic paper picks up on this, covering the form of control and RAB indexation.[9]

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**). There were no significant issues raised with having a revenue cap for Transpower and therefore we are not changing the form of control for Transpower. In February 2016 we published our emerging views on form of control to seek comments from stakeholders ahead of publishing our draft decisions. In June 2016 we published our draft decisions and welcomed submissions from stakeholders on our proposals. In September we published the technical consultation update paper; submissions on that paper mainly focussed on technical aspects of the wash-up mechanism and determination drafting and so these submissions are largely dealt with in the report on the review.

13. The pre-review IMs specify a weighted average price cap (**WAPC**) approach for EDBs and GDBs,[10] the option of a WAPC or revenue cap for GTBs,[11] and a revenue cap for Transpower.[12] The revenue caps we have set for Transpower and GTBs 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.[13] We therefore see a clear distinction between a revenue cap which effectively ensures allowable revenue is recovered and a revenue cap which uses lagged quantities and therefore does not. In this paper, we refer to a revenue cap which effectively ensures allowable revenue is recovered (because it does not use lagged quantities) as a 'pure' revenue cap.

14. As part of our draft decision package we published a letter from the Electricity Authority (**EA**) explaining it's concerns regarding pricing efficiency under a revenue cap. 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 have considered the EA's views in reaching our decisions.

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8 Commerce Commission "Invitation to contribute to problem definition paper" (16 June 2015), para 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.

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

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

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

12 Commerce Commission "Input methodologies (Transpower) reasons paper" (December 2010), para 7.3.7-7.3.10.

13 Commerce Commission "Setting Transpower's individual price-quality path for 2015—2020" (29 August 2014), para C45–C49.

15. This paper also covers our approach to RAB indexation and how it impacts EDBs, gas pipeline businesses (**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 our decisions on RAB indexation and what the impact is on returns and exposure to inflation risk.

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 published a paper as part of the gas pipeline DPP reset process on 28 June 2016 (**gas DPP implementation paper**). That paper included implementation details on how our proposed draft decision IM changes relating to the form of control for GDBs and GTBs would, if confirmed, take effect at the DPP reset.

18. We will publish our draft decisions on the gas DPP reset in February 2017, which will include the implementation details for the updated revenue cap for GTBs including compliance provisions.

Links between this topic paper and WACC

19. Although there is a link between our decisions on form of control and the impact on the weighted average cost of capital (**WACC**) asset beta, our 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.

20. We are not 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 make an adjustment, or what that adjustment should be, at this point.

Who does this paper apply to?

21. This paper applies to EDBs, GDBs, GTBs, and Transpower.[14]

[14] For Transpower, we only discuss RAB indexation, not the form of control.

Chapter 2: Form of control for EDBs

Purpose of this chapter

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

Structure of this chapter

23. This chapter explains:

    23.1 the three problems that we identified with the form of control for EDBs;

    23.2 our solution, to move EDBs from a WAPC to a 'pure' revenue cap;

    23.3 the reasons for our solution; and

    23.4 our design of the 'pure' revenue cap, including a wash-up mechanism for over- or under-recovery of revenue.

Problem definition

24. This section explains the problem definition, including how it evolved through submissions.

25. 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:

    25.1 incentives for regulated suppliers to invest efficiently (s 52A(1)(a) and (b));

    25.2 incentives for regulated suppliers to price efficiently (s 52A(1)(b));

    25.3 incentives for regulated suppliers to invest in energy efficiency and demand-side management (s 54Q); and

    25.4 the allocation of demand risk between suppliers and consumers during each regulatory period.[15]

26. For services subject to price-quality regulation under Part 4, we have primarily considered whether to apply a revenue cap or a WAPC. The pre-review IMs specify a WAPC for EDBs. A WAPC provides within-period average price stability for consumers but suppliers are exposed to the risk of over- or under-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

[15] Commerce Commission "Input methodologies (electricity distribution and gas pipeline services) reasons paper" (22 December 2010), para 2.7.3, 8.3.4, and 8.3.1.

increases above forecast, average prices would fall which would benefit consumers in the short term. Conversely, when demand decreases average prices would rise.

27. There are three key problems which we identified in relation to the WAPC for EDBs.[16] These are that:

    27.1 suppliers are exposed to the quantity forecasting risk which can be unmanageable and may provide disincentives for efficient expenditure;

    27.2 there may be a disincentive under the WAPC to pursue energy efficiency and DSM initiatives; and

    27.3 the current price cap and compliance requirements may create disincentives to restructure tariffs to move from one pricing approach to another.

Quantity forecasting risk

28. We consider that under a WAPC the quantity forecasting risk is a problem because it can impact the expenditure incentives on suppliers by causing either a significant revenue loss or a revenue gain. 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.

29. The potential for the forecast to erroneously set revenue too low for suppliers over a control period could potentially lead to inappropriate cut backs or deferral in expenditure and investment. This would not be consistent with s 52A(1)(a). On the other hand, where revenue is set too high, this would imply prices are higher than they need to be.

30. Under a WAPC, if suppliers moved from volumetric-based pricing to other price structures, the risk of over- or 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. PwC agreed with this point, explaining that even if pricing structures

[16] 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).

change, capacity or peak demand will still need to be forecast over time and so the risk of error would remain under a WAPC.[17]

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

32. In response to our Problem definition paper, Wellington Electricity Lines Limited (**Wellington Electricity**) 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.[18] Wellington Electricity suggested a move to a revenue cap because the risks to EDBs and consumers of windfall gains or losses are removed.

33. In its submission on our emerging views paper, Wellington Electricity 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. Also, Wellington Electricity explored this issue in its "initial high-level view" on the 2015 price-quality path reset, provided as a preface to its 2015 asset management plan. In this preface, which pre-dated the IM review, it said "The fundamental uncertainty of what revenue will actually be earned to fund investment, necessarily requires an inefficient year by year approach to network maintenance and renewal decisions."[19]

34. 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.

35. Electricity Networks Association (**ENA**) stated that "from our perspective the Commission's forecasts have not been particularly accurate to date".[20] It also noted that accurate quantity forecasting is also likely to become more difficult over time due to uncertainty regarding the uptake of emerging technologies and how these will impact on energy volumes.[21]

36. 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

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17 PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers – Made on behalf of 17 Electricity Distribution Businesses" (4 August 2016) para 83.

18 Wellington Electricity's submission "Input methodologies review – Problem definition" (21 August 2015).

19 Wellington Electricity "10 year asset management plan: 1 April 2015 – 31 March 2025" (31 March 2015).

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

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

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 from CPRG forecast errors 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 (paras 67 – 79).

37. In response to our draft decision, New Zealand Institute of Economic Research (**NZIER**) on behalf of Major Electricity Users' Group (**MEUG**) suggested that we consider the correlation between pricing structures and revenue variation. Meridian also suggested that businesses have the ability to reduce exposure to the quantity forecasting risk by moving to more efficient pricing.[22] In response to these concerns we conducted analysis on the impact of changing pricing structures on the quantity forecast risk. That analysis suggested that a move to peak-based pricing may make a supplier's revenue more volatile. This analysis is presented in our reasons section below (para 83-86).

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 DPP is set, including forecasts, should be the Commission's focus.[23]

39. Also, in a submission on our emerging views, 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,[24] because it simply replaces our forecast with an EDB volume forecast and then introduces a wash-up mechanism to allow faster response to forecasting errors.[25]

40. Based on these submissions and our own analysis, 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 incentives for suppliers to under-spend inefficiently.

Potential disincentive for energy efficiency and demand-side management

41. EDBs claim that, under a WAPC they are not incentivised to undertake energy efficiency and DSM initiatives,[26] which is inconsistent with s 54Q. This is because volumes are predominantly linked to revenue under a WAPC at present; if an EDB

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22 Meridian "Submission on input methodologies (IM) draft decisions papers (including the Report on the IM review)" (4 August 2016), p. 5.

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

24 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.

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

26 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.

undertakes energy efficiency or DSM initiatives, the volume of energy used by its customers will decrease resulting in lower revenues for the EDB.

42. 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.[27] 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).[28]

43. We consider 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

44. Through our compliance work and previous engagement with EDBs we have identified that the existing WAPC is creating a potential disincentive to pursue tariff restructuring. For suppliers this disincentive creates a barrier to moving to more efficient pricing. We consider that a pure revenue cap which does not require the use of lagged quantities would remove this potential barrier to restructuring tariffs.

45. We have considered whether any amendments to the WAPC could alleviate this problem and we are unconvinced an appropriate solution exists, nor has anyone presented a solution.

46. 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.[29] The barriers to tariff restructuring are created because, under a WAPC, pricing restructures create volume risk where suppliers may under-recover their revenues.

47. 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 pure revenue cap (removing the use of lagged quantities). This would eliminate EDBs' concerns about

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27 Commerce Commission "Input methodologies review invitation to contribute to problem definition" (16 June 2015).

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

29 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.

undertaking tariff restructuring.[30] The ENA stated within its submission that "EDBs are prohibited from taking into account behavioural responses to new price structures"[31].

48. EDBs are not currently prohibited from accounting for behavioural responses, and our compliance requirements paper lays out how potential behavioural responses to new price structures may be taken into account.[32] However, we acknowledge that there are practical difficulties for both suppliers and us in appropriately accounting for any potential behavioural responses.

49. Establishing a reasonable estimate of a historic lagged-quantity that corresponds to a restructured price can be a complex task. An EDB may not have historically recorded the quantity information which corresponds to the restructured price, as a new pricing structure may use different information than that which has been historically required. Where this information is available, (ie, the EDB has system capability to record and analyse quantity measures other than that which is billed, or the pricing structure is able to be constructed from existing datasets), concerns arise on the representativeness of using these quantities because the consumer would not have been responding to the price signal created by the new price.

50. Other complexities also make estimating a reasonable lagged-quantity difficult. These complexities include accounting for changes in business rules between periods which determine how quantity is calculated (eg, peak load timing), and different consumption profiles between periods due to external factors eg, weather.

51. In addition, a WAPC may work to discourage an EDB offering multiple different tariff offerings to consumers, particularly where it is likely that consumers' behavioural response will change over a number of years.

52. Alpine Energy suggested that we need to consider the compliance test and not necessarily change the form of control to address this problem.[33]

53. The EA and MEUG asked whether alternative means are available for compliance under a WAPC.[34] The ENA said that it is not aware of any practicable option.[35]

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

31 ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016), para 13.

32 Commerce Commission "Default price-quality paths for electricity distributors from 1 April 2015 to 31 March 2020, Compliance requirements" (28 November 2014).

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

34 Letter from Carl Hansen (Chief Executive, Electricity Authority) to Sue Begg (Deputy Chair, Commerce Commission) on possible implications for efficient distribution pricing of a decision to change the form of control for electricity distribution businesses (30 May 2016); and NZIER (report prepared for MEUG) "Form of control for EDB – draft decision – Advice on submission to the Commerce Commission (4 August 2016).

54. While more prescriptive requirements on expectations for establishing reasonable lagged quantities may reduce a perceived risk of non-compliance, this may itself prove restrictive to otherwise beneficial price restructures. It may also create a risk that suppliers restructure prices in a way which most easily fits within the Commission's compliance requirements, rather than for the purpose of pricing efficiently.

55. Concerns have also been raised by submitters that a revenue cap removes incentives to restructure tariffs efficiently in response to changing circumstances/technologies.

56. MEUG said that a move to a revenue cap seems to encourage EDBs to persist with volume-based charging – a pricing mechanism it claims does not support efficient recovery of network costs and shifts the risk of over-investment to consumers.[36] We note that the EA also considers that a WAPC provides stronger incentives for EDBs to adopt efficient prices from a number of aspects. This is discussed in our reasons section below (paras 91-98) and in Attachment A.

57. We acknowledge the trade-off that 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 some consumers do not inefficiently disconnect from the distribution network, irrespective of the form of control.

Solution: Adopt a 'pure' revenue cap for EDBs

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

59. In response to all three problems, our solution on the form of control for EDBs is to change from using a lagged WAPC to a 'pure' revenue cap.[37] Our key reasons for proposing this change are that it will remove:

    59.1 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));

    59.2 potential compliance barriers for suppliers to restructure their tariffs to be more 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

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35 ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016), p. 7.

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

37 The 'pure' revenue cap effectively ensures allowable revenues are recovered; however we have implemented a cap on the wash-up amount which does expose suppliers to some foregone revenue risk. This revenue exposure would be the result of significant demand reductions and is aimed at providing incentives for suppliers to manage demand risk.

59.3 a potential disincentive on suppliers to pursue energy efficiency and DSM initiatives (consistent with s 54Q).

60. We have also decided that the revenue cap will include an annual unders and overs wash-up mechanism with implementation features intended to:

60.1 be consistent with applying the *ex-ante* financial capital maintenance (**FCM**) principle,[38] 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

60.2 reduce the risk that consumers are exposed to price shocks within the regulatory period.

61. To give effect to this solution, we have amended 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).[39]

Reasons for our solution

62. This section explains our assessment of the form of control for EDBs and our reasons for our 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 less likely to be inefficiently incentivised to under-spend without the risk of quantity forecasting error.

63. We have also considered the potentially important impact on pricing incentives the EA and submitters have raised.[40] While we recognise the theoretical pricing efficiency benefits of a WAPC under specific conditions, we consider that the demand and cost characteristics of EDBs limit these theoretical concerns in practice. Further, the design of the WAPC itself acts as a barrier to tariff restructuring (and therefore moving to more efficient pricing) due to compliance requirements, and removing this barrier will allow tariff restructuring. We consider these effects outweigh the negative effects of shifting demand risk to consumers within the period and any potential reduction in incentives for tariff efficiency in the short term with a revenue cap.

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38 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).

39 The Report on the review will capture the pre-review policy decisions that will change as a result of our solutions.

40 See for example: Letter from Carl Hansen (Chief Executive, Electricity Authority) to Sue Begg (Deputy Chair, Commerce Commission) on possible implications for efficient distribution pricing of a decision to change the form of control for electricity distribution businesses (30 May 2016); MEUG "Submission on Input methodologies draft review decisions" (4 August 2016); and NZIER (report prepared on behalf of MEUG) cross submission on IM review draft decisions papers "Form of control for EDB – cross submission advice" (18 August 2016).

64. Supplier submissions on our draft decisions were supportive of our proposal to move to a revenue cap.[41] Contact Energy explained that it was supportive of a revenue cap if it was implemented with cost reflective pricing.[42] However, MEUG did not support the revenue cap proposal, on the basis that alone it would not incentivise efficient pricing.[43]

65. We considered the pros and cons of moving EDBs from a WAPC to a revenue cap from the following aspects:[44]

    65.1 incentives for efficient expenditure, consistent with s52A(1)(a) and (b);

    65.2 incentives for energy efficiency and DSM, consistent with s54Q;

    65.3 incentives for pricing efficiency and tariff restructuring, consistent with s52A(1)(b);

    65.4 connection incentives, consistent with s52A(1)(a); and

    65.5 price stability, which is a factor that consumers tend to value.

66. We have also considered the concerns that the EA raised in its letter in reaching our decisions.

Incentives for efficient expenditure

67. We consider that incentives for efficient expenditure is the most important aspect when considering the differences between revenue caps and price caps. Revenue caps and price caps have different implications for suppliers' incentives for efficient investment, because they expose suppliers to demand risk differently.

68. 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.[45] 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

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41 See for example: Aurora "Input methodologies review: Update paper on the cost of capital topic" (5 February 2016); ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016); and PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers – Made on behalf of 17 Electricity Distribution Businesses" (4 August 2016).

42 Contact Energy submission on IM review draft decisions papers "Input methodology review" (4 August 2016) p. 1 and p. 6.

43 MEUG "Submission on Input methodologies draft review decisions" (4 August 2016); and NZIER (report prepared for MEUG) "Form of control for EDB – draft decision – Advice on submission to the Commerce Commission (4 August 2016).

44 These aspects were chosen because they align with the purpose statement set out in s 52A and the function of s 54Q.

45 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).

decreases and costs are spread across the remaining consumers when the price-quality paths are reset).

69. We consider that it is helpful to distinguish between the two elements of overall demand risk.

    69.1 'demand uncertainty risk' – the inherent uncertainty in future demand over the time period of the price-quality path.

    69.2 'quantity forecasting risk' – the extent to which our forecast diverges from the supplier's own expectations.

70. Depending on whether forecast billing quantities and therefore forecast revenue are significantly lower or higher than suppliers believe is achievable, the quantity forecasting risk may incentivise suppliers to spend less than efficient levels of capital (and operating) expenditure within the regulatory period.

71. 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 demand risk may be better mitigated by suppliers than consumers because suppliers can set prices to encourage demand, engage in marketing, facilitate new connections, etc. Given the potential magnitude of forecasting error, we consider that the benefits of removing the quantity forecasting risk outweigh the fact that the demand uncertainty risk will shift further to consumers.

72. An additional benefit of moving to a revenue cap is avoiding any asymmetric information problems relating to suppliers' submissions to us about setting constant price revenue growth (**CPRG**) forecasts.

73. As part of our recent report analysing EDB profitability,[46] we examined the materiality of the overall demand uncertainty 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. The profitability report analysis centred on a three-year period consistent with the time period we focussed on when DPPs were reset mid-period.[47]

74. As part of the modelling that accompanied the report, we also considered the impact on revenue over a five-year period. Modelling the analysis over five years was possible because, in November 2012, we developed CPRG forecasts for a full five-

[46] Commerce Commission "Profitability of Electricity Distributors Following First Adjustments to Revenue Limits" (8 June 2016).

[47] Our key findings for the three year period were that our forecasts generally performed well on average; and alongside operating expenditure, the revenue growth assumption showed the largest variation in terms of the impact on the returns of individual distributors.

year period. It is worth noting that the forecasts used in estimating the CPRG were developed midway through the five-year period and applied for three years (rather than five), and as a result may have been less prone to errors which can be compounded over time.

75. Figure 1 presents our analysis of the modelled impact of CPRG assumption on present value (**PV**) revenue over a five-year period.[48]

76. Modelling the impact on PV revenue over five 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.

77. 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.[49]

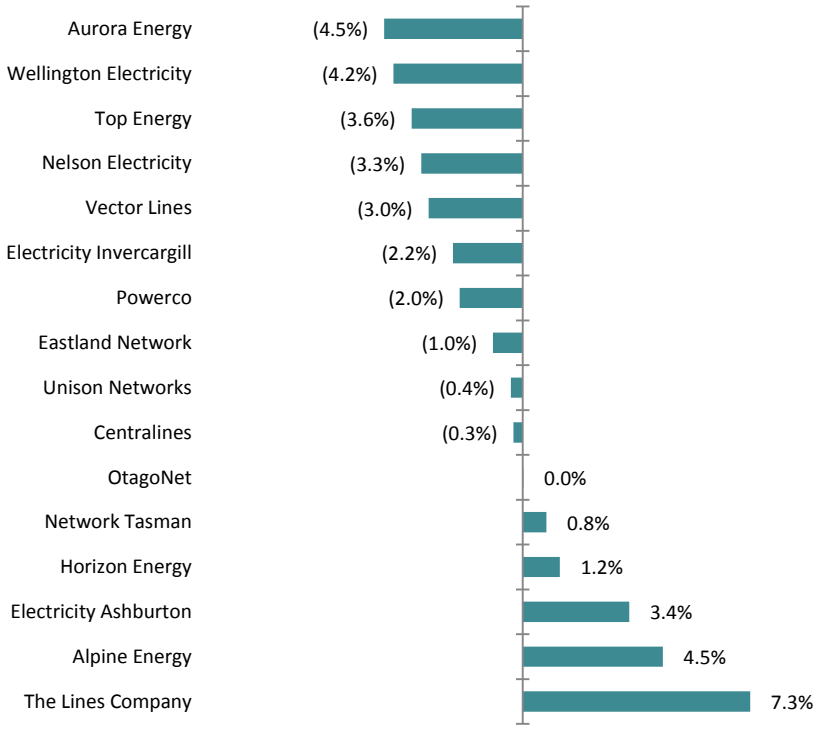
78. The modelled impact suggests that the PV of revenue for some EDBs would have been significantly lower than forecast, for example the impact on Aurora Energy would have been -4.5% and the impact on Wellington Electricity would have been -4.2%. However, for other EDBs their revenue would have been higher than forecast, such as The Lines Company (7.3%) and Alpine Energy (4.5%).

79. Amongst other things, the levels of variation shown in Figure 1 are based on differences between the actual pricing structures adopted by distributors and those assumed when the DPP was set. Therefore the impacts reflect any action taken by distributors to restructure tariffs in response to any pricing incentives inherent in a WAPC.

[48] The numbers in Figure 1 are not directly comparable to the figures quoted in the profitability report, because Figure 1 measures the impact on the PV of revenue rather than the impact on returns which the profitability report presented.

[49] To give an idea of the materiality of this, if opex were 38% of distribution revenue and bore all the reductions as a result of a CPRG forecasting error of -4.5% impact on distribution revenue, then it would mean that opex spend would be reduced by 11.8%.

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



80. In response to our draft decision, Contact said that it has seen no evidence of EDBs underinvesting under the current framework.[50] However, we note that in Wellington Electricity's 2015 Asset Management Plan it explains that the uncertainty around its revenue recovery as a result of our forecasting affected investment and expenditure decisions.

81. Wellington Electricity claimed that this revenue uncertainty means that it will need to determine its ability to fund capital and operating expenditure on a year by year basis, making it very difficult to deliver efficient investment that is optimal for the long-term benefit of consumers.[51]

82. We consider that if as a consequence of our CPRG forecasting an EDB does not have enough revenue to spend on maintenance etc, then there could be lower levels of reliability until they spend more on the network later, or there will be more deterioration in the network which will be more expensive to rectify later. We consider that suppliers will need to make up this under-spend in later years at higher overall cost to consumers, meaning that customers will be paying more in the longer term.

50 Contact Energy submission on IM review draft decisions papers "Input methodology review" (4 August 2016), p. 4.

51 Wellington Electricity "10 year asset management plan: 1 April 2015 – 31 March 2025" (31 March 2015) p. 8.

83. In its June 2016 letter the EA 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.[52] It suggests that EDBs are best placed to weigh up the volume risks against the costs of changing price structures.

84. Also, Meridian suggested that EDBs should be able to reduce their exposure to the quantity forecasting risk by moving to more efficient pricing.[53] MEUG argued in its submission that a move by EDBs to less volumetric-based pricing and more fixed daily charges would reduce quantity forecasting risk because the number of connections is less variable than the annual volume of electricity served.[54] We agree that this is likely to be correct if EDBs shift volumetric-based pricing to fixed daily pricing.

85. However, we consider that some measure of peak demand may also be an increasingly common element of more efficient price structures – particularly if the EDB is attempting to signal network constraints. An increased use of a measure of peak demand as an element of price structures is likely to increase the quantity forecasting risk, because annual peak demand is more variable than annual volume. Figure 2 below shows that the absolute annual variation in peak demand is generally greater than that of annual volumetric demand. Therefore, quantity forecasting risk could even increase if EDBs move towards more efficient and service-based pricing structures.

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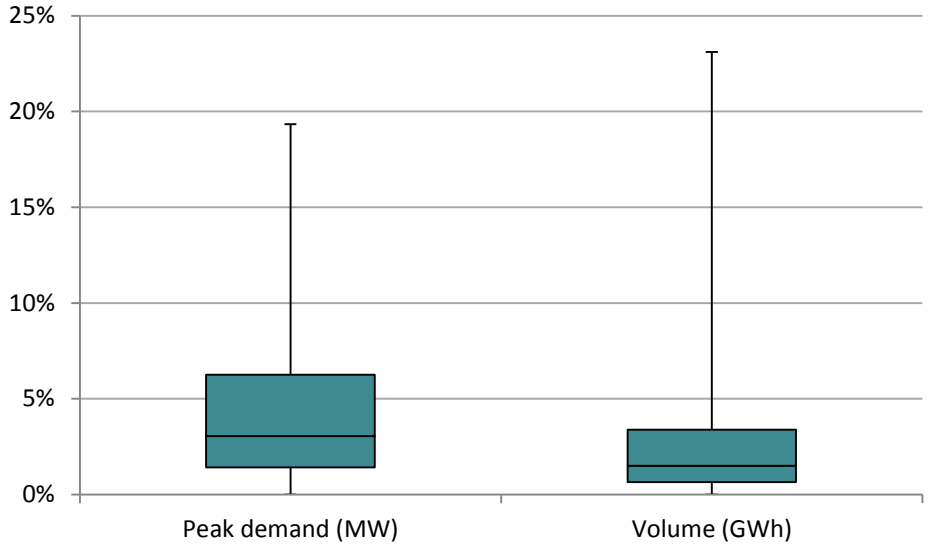
52 Letter from Carl Hansen (Chief Executive, Electricity Authority) to Sue Begg (Deputy Chair, Commerce Commission) on possible implications for efficient distribution pricing of a decision to change the form of control for electricity distribution businesses (30 May 2016), p. 8-9.

53 Meridian "Submission on input methodologies (IM) draft decisions papers (including the Report on the IM review)" (4 August 2016).

54 NZIER (report prepared for MEUG) "Form of control for EDB – draft decision – Advice on submission to the Commerce Commission (4 August 2016).

Figure 2: Average annual variation of peak and volumetric EDB demand (2011-2015)[55]



86. It is currently unclear what proportion of revenue from EDBs will come from fixed, volumetric, or peak demand-based pricing in the future. We are unsure on the timing and scale of future pricing structure changes and what those changes will be. As described, different pricing structures will have different effects on the quantity forecasting risk. Therefore, we consider that a move to more efficient pricing structures by EDBs will not necessarily reduce the demand certainty risk and may worsen it.[56]

87. 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 promote efficient expenditure, consistent with s 52A(1)(a) and (b).

Incentives for energy efficiency and demand-side management

88. We consider that moving EDBs from a WAPC to a revenue cap will help to better promote s 54Q.

89. 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.

[55] The box and whisker chart in Figure 2 is for all EDBs except for Orion, which was excluded due to unique outcomes resulting from the Canterbury earthquakes.

[56] We note The Lines Company is the EDB that has most substantially restructured its pricing over the past 10 years with the intention of being more efficient and service-based. As can be seen in Figure 1, the difference between the forecast and actual level of demand growth had a greater impact on profitability for The Lines Company than all other non-exempt EDBs over 2011-15.

90. Submissions on our draft decisions suggested that if we move to a revenue cap the energy efficiency and demand-side management scheme should be removed.[57] We agreed that this scheme is no longer required under a revenue cap and it has been removed.[58]

Incentives for pricing efficiency and tariff restructuring

91. Our view is that pricing efficiency and tariff restructuring are important to consider. The chosen form of control may not only affect the flexibility EDBs have to adjust their pricing levels and structures, but also their incentives to price efficiently.

92. Attachment A discusses some theoretical and practical considerations about efficient pricing under both forms of control – WAPC and revenue cap.

93. The EA has raised a concern[59] (also supported in the economic literature[60]) that EDBs might have an incentive to price inefficiently under a revenue cap. The issue raised is that under a revenue cap there is a risk of inefficient pricing as suppliers may over-price,[61] especially to price-sensitive customers to reduce costs. Suppliers might cause price-sensitive customers to reduce demand to defer investment inefficiently, therefore reducing costs for the supplier and maximising profit (as revenue is already agreed).

94. A number of suppliers considered many of these concerns to be theoretical and overlook EDBs' actual business practices.[62]

95. As we explain in Attachment A, we have concluded that these concerns over efficient pricing that revenue caps give rise to may not apply as strongly in practice for structurally separated electricity distributors.

96. We consider that there are a mix of factors encouraging pricing efficiency,[63] which taken together, are likely to dominate over any potential diminished incentives to price efficiently under a revenue cap. These factors include EDB's longer term

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57 Contact Energy submission on IM review draft decisions papers "Input methodology review" (4 August 2016) p. 1; ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016) p. 10; and Orion "Submission on input methodologies review – draft decisions" (4 August 2016) p. 14.

58 The consequential removal of the scheme was proposed in the draft decision Report on the Review. Commerce Commission "Input methodologies review draft decisions: Report on the IM review" (22 June 2016), para 282 and 300.

59 Electricity Authority "Possible implications for efficient distribution pricing of a decision to change the form of control for electricity distribution businesses" (30 May 2016), p. 3.

60 Crew, M.A., Kleindorfer, P.R. "Incentive regulation in the United Kingdom and the United States: some lessons." (1996), 211-225; and Steven Stoft, "Revenue Caps vs. Price Caps: Implications for DSM", (1995).

61 Prices that may exceed what an unregulated monopolist would charge.

62 For a selection of views, see for example: Aurora "Cross-submission, Input Methodologies Review: Draft Decision and Determination Papers" (18 August 2016), p. 7.

63 We note that some factors will positively encourage pricing efficiency but others may simply mean that any potential diminished incentives to price efficiently under a revenue cap do not hold in practice.

incentives to recover the cost of their investments; the nature of the sector's cost structure (ie where fixed costs make up a significant proportion of the total); the dynamics of reaching the high price (which diminish the likelihood of a successful material price increase); relatively low price elasticities of demand; EDBs' limited ability to identify price-sensitive consumers; the constraints placed by the design of the revenue cap; the EA's ongoing work on distribution pricing; emerging technology developments; and non-economic constraints on pricing such as public perceptions.

97. Additionally we note that there is a potential tension between promoting incentives to invest in energy efficiency (s 54Q) and some aspects of pricing efficiency. For example, under Ramsey pricing, the firm seeks to minimise losses in demand, which could be in conflict with improving energy efficiency.

98. On balance, we consider that moving EDBs from a WAPC to a pure revenue cap would remove potential compliance barriers for suppliers to restructure their tariffs to be more efficient (consistent with s 52A(1)(b)).

Connection incentives

99. We also considered the relative merits of a revenue cap by considering the incentives created for new connections. The form of control could affect suppliers' motivation to establish new connections for consumers, which is another aspect of incentives for efficient investment.

100. 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).

101. 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 in allowable revenue at the following reset. From an EDB point of view, we do not consider there would be much capital expenditure involved net of capital contributions.

102. We intend consulting on 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 would be 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. Vector suggested that we would be introducing disproportionate compliance requirements to address an unsubstantiated concern.[64] We do not consider this is an unsubstantiated concern; we consider that increasing the information disclosure requirements will be necessary to better understand performance in this area and that the additional ID requirements can be straightforward and need not be disproportionate for suppliers.

103. In response to our emerging views paper and in submissions on our draft decisions, 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.[65] In its submission ENA said that if EDBs can only recover the connection costs from the next price reset, they will be accepting a loss up until that point and will not expect to achieve real FCM on those investments. ENA also suggested that EDBs could be allowed to set additional prices for new large connections outside of the revenue cap for the remainder of the regulatory period, where such new connections had not been specifically allowed for in the setting of the DPP.[66]

104. However, we do not consider that a connections incentive should be a recoverable cost as suppliers could relatively quickly recover the costs of new connections through their capital contributions policies, even those which were unforeseen at the time the price-quality path was set. 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, and Unison said that setting high capital contributions is not likely to be preferred by consumers compared to longer term recovery through line charges.[67] While we acknowledge those points, we note that capital contributions could be spread over a number of years.

105. Powerco said it agrees with us that in practice a pure revenue cap will not alter an EDB's incentives to connect new customers and maintain connection growth.[68] We

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64 Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016) para 166- 168.

65 See for example; ENA "Input Methodologies review – Topic paper 1, form of control and RAB indexation" (4 August 2016), p. 4 and p. 10; and Orion "Submission on input methodologies review – draft decisions" (4 August 2016), p. 10; Powerco "Submission on the four emerging views papers" (29 February 2016), para 16.2; and 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.

66 ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016) para 33-34.

67 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; and Unison "Submission on the input methodology review" (4 August 2016), para 10.

68 Powerco "Submission on input methodologies review – Draft decisions" (4 August 2016), para 44.

consider that there remains an incentive for EDBs to connect new customers in order to retain the value of the network over the long term.

106. Wellington Electricity 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 Wellington Electricity that EDBs have options to manage the potential connections disincentive that may be created by moving to a revenue cap.

Price stability

107. We also considered the benefits of a revenue cap by considering the impact on 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.

108. A revenue cap provides suppliers with guaranteed revenue but it may lead to more price volatility within the price control period than a WAPC. This point was raised by MEUG in its submission on our draft decision, noting that greater revenue certainty for suppliers is at the expense of greater price volatility for consumers.[69] However, we note that the potential for greater price volatility under a revenue cap would be kept within a period, and that there may be a lower likelihood of volatility between periods under a revenue cap compared to a WAPC.

109. In our draft decision we proposed providing for annual limits on pass-through of over- and under-recovery to help manage within-period price volatility under the proposed revenue cap. The majority of submitters were not supportive of the complexity of the wash-up mechanism design and questioned whether a "cap and collar" on the annual draw down amount is needed to reduce price volatility, given we were also proposing a limit on the average price increase in each year.[70] Some submitters also suggested that the cap and collar on the draw down is not required because suppliers have existing incentives (through commercial and reputational reasons) to minimise price shocks to consumers.[71]

110. As is discussed further below, we have decided not to include the cap and collar on the draw down amount in the wash-up mechanism.

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69 NZIER (report prepared for MEUG) "Form of control for EDB – draft decision – Advice on submission to the Commerce Commission (4 August 2016), p. 6.

70 See for example PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers – Made on behalf of 17 Electricity Distribution Businesses" (4 August 2016) p. 17.

71 See for example; Wellington Electricity "Input methodologies review: Response to draft decisions" (4 August 2016) p. 2.

Overall view of our reasons

111. In weighing up the five aspects from which we addressed the form of control for EDBs, we considered the quantity forecasting risk to be the most important aspect. 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.

112. We also considered that the revenue cap would allow suppliers more flexibility to restructure tariffs to be more 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 revenue cap for EDBs

113. This section explains the principles behind how the 'pure' revenue cap with a wash-up mechanism will work for EDBs.

114. 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 the 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 will be different from the current lagged revenue cap for GTBs which requires notional revenue to be no greater than allowable notional revenue.[72]

Determining the allowable revenue for each year when prices are set

115. The allowable revenue at the beginning of each year of a regulatory period will be based on the following three components:

    115.1 the "forecast net allowable revenue", which will provide for the recovery over the regulatory period of building blocks costs set under a DPP or customised price-quality path (**CPP**) determination. This component will grow by forecast CPI-X from each year to the next;

    115.2 forecast pass-through and recoverable costs; and

    115.3 the balance of the wash-up account.

[72] 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.

116. The forecast net allowable revenue for the first year of a regulatory period will be the maximum allowable revenue in that year as calculated in the financial model for the DPP or CPP.[73]

117. As long as suppliers base their prices on forecast allowable revenues they should be compliant.

118. When a supplier is setting its prices based on forecast revenues, it will not be able to accurately price up to the actual 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'.

119. Each supplier will be required to set prices such that its estimate of revenue will be no more than the forecast 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).

120. Overall, except where the cap on the revenue wash-up amount applies (discussed further below), the wash-up mechanism will restore each supplier to the position it would have been in had the year-ahead quantity forecast, pass through and recoverable cost 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 equivalent of the perfect foresight position.

Wash-up mechanism

121. We will implement 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. The cap on the allowed wash-up amount would apply following a large demand reduction, such as a catastrophic event.

122. 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 to be drawn down two years after the relevant revenue year.

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[73] As set out in the Report on the IM review, we decided that a capex wash-up adjustment will 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.

123. 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.

124. PwC suggested that there should be a partial wash-up in the year after the year in which the balance is created.[74] We considered this suggestion but decided that the additional complexity is unwarranted given the adjustment for the time value of money.

125. The wash-up mechanism will also deal with differences between forecast and actual CPI. The CPI-X adjustment to forecast 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.

126. The CPI adjustment made for the purposes of price setting will be based on the Reserve Bank's forecasts of CPI and the actual CPI change that is subsequently published by Statistics New Zealand will be factored into the wash-up.

127. 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.

128. The ENA suggested that we could use the rate of change (X-factor) to smooth price impacts over time.[75] We can adjust the X-factor to mitigate a price shock between regulatory periods, but this cannot deal with the intra-period price shocks once the price path has been set.

129. As part of the wash-up mechanism, pass-through and recoverable costs will always be fully washed up. This will be true even in the case of the cap on the wash-up amount being applied (the cap on the wash-up amount is discussed below). Vector commented that under a revenue cap EDBs will be exposed to even greater forecasting risk because, as well as forecasting risk from pass-through and recoverable costs, EDBs must also forecast quantities (eg, kWh) and forecast the likely impact of any tariff restructuring.[76] We note that forecasting error will be washed up as part of the wash-up mechanism, subject to this cap on the wash-up amount.

130. Figure 3 shows the conceptual process and the key features of the revenue cap wash-up mechanism. The key features that we have implemented are:

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74 PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers – Made on behalf of 17 Electricity Distribution Businesses" (4 August 2016), para 103.

75 ENA "Input Methodologies review – Topic paper 1, form of control and RAB indexation" (4 August 2016), para 20.

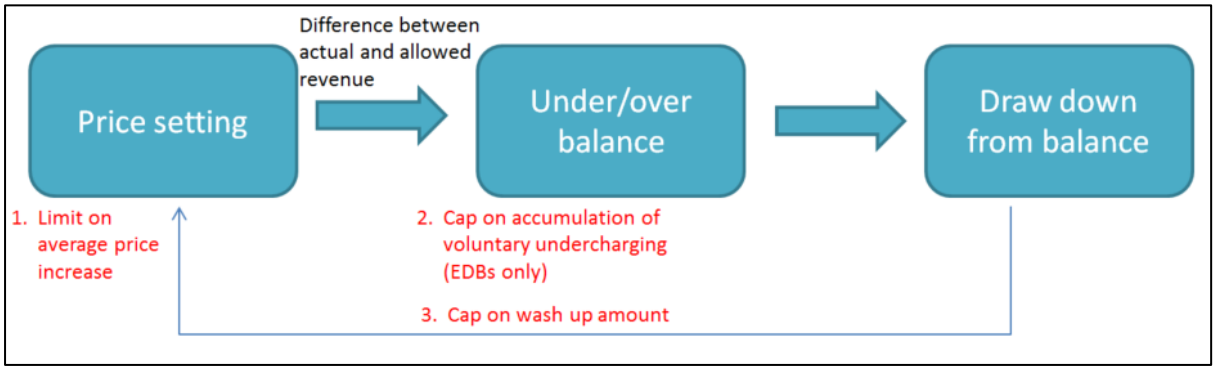
76 Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), para 17 and 19.

130.1 a limit on average price increase;

130.2 a cap on the accumulation of voluntary undercharging (EDBs only); and

130.3 a cap on the wash-up amount.

Figure 3: Conceptual diagram of wash-up mechanism process and key features



Features of the wash-up mechanism

131. Several submissions on our draft decisions suggested that the wash-up mechanism was too complex, primarily because it contained too many features and there was not enough certainty within the IMs on which features would apply.[77] To address these concerns we have not included a cap and collar on the draw down amount and we have provided more certainty in the IMs on which features will apply. Our decisions on each of the features of the wash-up mechanism are explained below.

132. Information on the compliance process for GPBs will be included in the gas DPP draft decision paper. We envisage that similar processes could be adopted for the revenue cap for EDBs at the next reset.

133. We have provided more detail to illustrate how the features might operate as part of the combined revenue cap wash-up mechanism in the flow charts attached to the Report on the review.[78]

134. Also, as part of our consultation on the gas DPP draft decision in February 2017 we will include a simple model showing how the wash-up mechanism might work in practice for GTBs.

[77] See for example: ENA "Input Methodologies review – Topic paper 1, form of control and RAB indexation" (4 August 2016); Orion "Submission on input methodologies review – draft decisions" (4 August 2016); Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016).

[78] Commerce Commission "Input methodologies review final decision: Report on the IM review" (20 December 2016), Attachment D.

Limit on average price increase

135. The purpose of this feature is to address the concern that there is the potential for large downward demand shocks that result in large price increases to consumers. The constraint will take effect when prices are set at the beginning of each year of the regulatory period. We will set a limit to the percentage increase in 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. However, we have included 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.

136. This is a forward-looking constraint, so if a supplier forecasts that there is going to be a significant demand drop (that would cause average prices to exceed the limit) the constraint would take effect when setting prices.

137. In response to our draft decision, some submitters were not supportive of this feature for EDBs because they suggested that the lines businesses are best placed to manage price shocks and that they already take actions to do so. ENA said that "when undertaking price restructures ENA members routinely seek to transition to new structures over time to reduce the scale of any price shocks", and PwC said that they are not convinced that regulatory tools to address price shocks are necessary as distributors already take steps to manage price shocks on their networks.[79]

138. We consider that a price smoothing mechanism is required to manage the 'within-period' volatility that may occur under a revenue cap. ENA recommended that if a price smoothing mechanism is applied then there should be no more than one of them.[80] We consider that, where implemented, the limit on average price increase would be more effective than the cap and collar on the draw down amount (that was proposed in our draft decision); and therefore we have decided to provide for just a limit on average price increase and not include a cap and collar on the draw down amount (as explained more in the cap and collar section below).

139. In response to our draft decision, Alpine Energy commented that we were putting into place allowances now for a mechanism that we may or may not introduce in the future which introduces uncertainty unnecessarily.[81] To address this concern, we considered which of the features of the wash-up could be mandatory in the IMs to improve the certainty that they would be applied in practice. We decided that the limit on the average price increase will be an optional provision in the IMs, because it

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79 ENA "Input Methodologies review – Topic paper 1, form of control and RAB indexation" (4 August 2016) para 20; and PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers – Made on behalf of 17 Electricity Distribution Businesses" (4 August 2016) para 20.

80 ENA "Input Methodologies review – Topic paper 1, form of control and RAB indexation" (4 August 2016) p. 3.

81 Alpine Energy "Submission to the Commerce Commission on input methodologies review: Draft decisions papers" (4 August 2016) para 16.

is NPV-neutral and it is therefore not as important to have certainty over whether it will apply.[82]

140. The percentage value of the limit on the average price increase would be specified in the DPP or CPP determination. This limit is intended to apply to average line charges and not to revenues. 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.

141. The provision for the limit in the IM determinations is sufficiently flexible that calculating the average price increase could be based, for example, on a single unit of demand, a (weighted) combination of different units of demand, or the choice of demand unit for which there is the greatest change. This is intended to improve the workability of this feature.[83]

Cap on accumulation of voluntary undercharging – EDBs only

142. The purpose of this constraint is to address the possibility that a large credit amount may build up in the over/under balance in the wash-up account from EDBs intentionally undercharging. A supplier might not fully charge its consumers up to the limit of its allowable revenue.

143. 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 draw down that balance. This feature will 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.

144. 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 cumulative amount of this difference that could be washed up. Any excess over this cap will be foregone permanently. The value of this cap will be specified as part of the EDB DPP or CPP determination.

145. 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 pass-through costs or recoverable costs.

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82 This was included in the technical consultation paper.

83 See, for example: First Gas "Submission on DPP for gas pipeline services from 1 October 2017" (4 August 2016), p. 1.

146. 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.

147. 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 draw down amount will be a recoverable cost.

148. In our draft determinations we allowed for the provision of this feature in the IMs and said that the DPP or CPP would have the discretion over whether to apply this feature or not. As submissions requested greater certainty on these features in the IMs,[84] we have decided to make this a standard feature as part of a DPP or CPP for EDBs. This means that in the EDB DPP or CPP determination provisions will be required as to how the cap will be implemented. The amount of the cap may differ (or not apply) for different EDBs.

149. PwC submitted that a supplier might under-charge in one year with the intention of recovering that under-charge in the following year, and that our draft approach would not allow that.[85] We note that our approach does allow for the wash-up, but a year later than PwC submit a supplier might intend.

Cap on wash-up amount

150. 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.

151. The cap will limit the amount of revenue that may be recovered through the wash-up mechanism, if there is a significant reduction in revenue (ie, more than 20%). In most cases this will be due to a significant reduction in demand (ie, billed quantities). The wash-up amount will be the allowable revenue less actual revenue less 'revenue foregone', where revenue foregone would be expressed in terms of the revenue reduction percentage, less 20% (ie the cap), applied to net allowable revenue. The actual formula would be specified in a DPP or CPP determination.

152. In our draft determinations we also allowed for the provision of this feature in the IMs but said that, in setting the DPP or CPP, we would have the discretion over whether to apply this feature or not. As submissions requested greater certainty on these features in the IMs, we have decided to make this feature mandatory as part

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84 Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), para 139-140.

85 PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers – Made on behalf of 17 Electricity Distribution Businesses" (4 August 2016) p. 17.

of a DPP or CPP for EDBs and for GTBs, and to specify the cap percentage (20% of net allowable revenue as specified in a DPP or CPP determination) in the IMs.

153. 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.[86] 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 will 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 be exposed to some of the demand risk and therefore have a greater incentive to prepare for large demand shocks.

154. In the Orion CPP decision,[87] 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:

    154.1 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;

    154.2 regulated suppliers (and their investors) are generally better placed to manage the risks of catastrophic events than consumers; and

    154.3 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).

155. In response to our draft decision, suppliers were largely not supportive of this cap.[88]Alpine Energy commented that we did not quantify what would be considered as a large demand shock and therefore there is a risk associated with commenting on a mechanism now without knowing the detail until later.[89] Some submitters commented that the cap on the wash-up amount is inconsistent with ex-ante

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86 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).

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

88 See for example: ENA "Input Methodologies review – Topic paper 1, form of control and RAB indexation" (4 August 2016); First Gas "Cross-submission on input methodologies review draft decisions (excluding cost of capital)" (18 August 2016); Orion "Submission on input methodologies review – draft decisions" (4 August 2016); and Unison "Submission on the input methodology review" (4 August 2016).

89 Alpine Energy "Submission to the Commerce Commission on input methodologies review: Draft decisions papers" (4 August 2016), p. 4.

expectation of achieving real FCM and that it creates an asymmetric loss of revenue which is inconsistent with the principle of risk sharing.[90] To address stakeholders' concerns, we have specified the cap to be 20% of net allowable revenue with the aim of providing certainty on the likely impact of the cap on revenues. We consider that the cap provides an appropriate balance between being high enough to ensure that *ex-ante* compensation is not required, but low enough to still provide an incentive for suppliers to prepare for large demand shocks.

156. The cap does not apply to the recovery of pass-through costs or recoverable costs from regulated revenue. In the event of a large demand shock, suppliers will be able to wash-up (and therefore consumers will pay for) up to 20% of net allowable revenue (which is an amount net of pass-through costs and recoverable costs) of the regulatory period. In addition, this will be unaffected by any draw down of the wash-up balance or the impact of the limit on the calculated average price increase.

157. We consider that the same value is appropriate for both EDBs and GTBs, and 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),[91] and are:

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

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

    157.3 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.

158. In our final decision for setting the customised price-quality path of Orion we explained that:[92]

> 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

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90 Alpine Energy "Submission to the Commerce Commission on input methodologies review: Draft decisions papers" (4 August 2016), p. 3-4; ENA "Input Methodologies review – Topic paper 1, form of control and RAB indexation" (4 August 2016) p. 9; Unison "Submission on the input methodology review" (4 August 2016) para 10; and Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), p. 29-31.

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

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

> 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.

159. We also reiterated this decision in our reasons paper for the amendment to the WACC percentile for price-quality regulation.[93]

Cap and collar on draw down amount – not implemented

160. In our draft decision we proposed having a cap and collar on the draw down amount from the wash-up account.[94] The purpose of the cap and collar on the draw down amount was to address the concern that a revenue cap may lead to price volatility within the period resulting from the wash-up process. The aim of the cap and collar was to smooth the wash-up amounts that can be recovered across the period, to avoid large wash-up amounts affecting prices annually.

161. In submissions on our draft decision, suppliers had concerns about the caps and collars and did not think that we needed to include all of the proposed features (particularly both the cap and collar on the draw down amount and the limit on average price increase, because suppliers considered that they both aim to serve a similar purpose).[95] Aurora questioned whether the cap and collar on the draw down amount is needed to reduce price volatility given we are also proposing a limit on average price increases.[96] Vector suggested that "the cumulative effect of both the constraint on average price increases and the cap and collar on the wash-up draw down amount would limit the ability to restructure prices, introduce additional uncertainty and over complicate the price setting process".[97] Wellington Electricity

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

94 Commerce Commission "Input methodologies review draft decisions: Topic paper 1 – Form of control and RAB indexation for EDBs, GPBs and Transpower" (16 June 2016), para 117 -119.

95 For example; Aurora "Submission – Input methodologies review: Draft decision and determination papers" (4 August 2016), p. 7.

96 Aurora "Submission – Input methodologies review: Draft decision and determination papers" (4 August 2016), p. 7.

97 Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), para 23.

also considered that the inclusion of a cap and collar on the draw down amount introduces unnecessary complexity.[98] However, Vector said that it had considered the workability of the mechanisms and its view was that the only mechanism that will address potential price volatility is the cap and collar on the draw down amount.[99]

162. After considering submissions, we have decided not to implement this feature to avoid the wash-up mechanism becoming overly complex. We consider that the main concern from consumers will be price shocks and we think that the limit on average price increase can mitigate this concern because it can be used to limit annual price increases for consumers.

Accounting for wash-up amounts

163. Each supplier must maintain a wash-up account to account for the following.

163.1 The wash-up balance.

163.2 Any difference between a supplier's actual allowable revenue and actual revenue.

163.3 Amounts drawn down from the wash-up account. These amounts would be recoverable costs, and could be positive or negative.

163.4 Time value of money adjustments. A balance left in the wash-up account at the end of one year would be adjusted by the post-tax WACC applying to the price-quality path for the regulatory period to reflect the opportunity cost of holding that balance for another year.

163.5 Any amount of revenue foregone.

163.6 Any voluntary undercharging amount.

164. This 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 years of a regulatory period could be washed up in the first and second years of the subsequent regulatory period.

165. The revenue wash-up will produce a cumulative balance of revenue under or over-recoveries over time. As that balance will result in the shifting of revenue over years, a time value of money rate will need to be applied.

166. We have specified in the IM determinations that if there is a balance in favour of consumers in the wash-up account, then the balance must be drawn down. We have

98 Wellington Electricity "Input methodologies review: Response to draft decisions" (4 August 2016) p. 2.

99 Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), para 22.

made this change to ensure that a balance in favour of consumers does not build up in the wash-up account and that the revenue is returned to consumers as soon as possible.

167. We will apply a time value of money rate equal to the post-tax WACC at the 67th percentile for the DPP or CPP regulatory period. This approach would ensure that wash-up amounts are discounted at our estimate of the suppliers' opportunity cost of funds (WACC).

168. This approach is similar to the approach we have used for Transpower's comparable Economic Value account. We will use the post-tax WACC for the relevant DPP or CPP period, as that is effectively the prevailing discount rate used in setting the price-path for the regulatory period.[100]

169. We note also the 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.

170. 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 the relevant DPP or CPP determination. Further details on compliance requirements, 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 draft decision due to be released in February 2017. Although the gas DPP draft decision paper will focus 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. Any compliance related matters that are not covered by IM rules (including issues raised in submissions on the IM review), will be discussed through the gas DPP process.

[100] In practice, the DPP is set using a vanilla WACC, because the DPP is set with the interest tax shield being explicitly modelled.

Chapter 3: Form of control for GTBs

Purpose of this chapter

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

Structure of this chapter

172. This chapter explains:

172.1 the problem we have identified with the form of control for GTBs;

172.2 our solution to move from a lagged revenue cap to a 'pure' revenue cap;

172.3 our reasons for our solution; and

172.4 our design of the 'pure' revenue cap, including a wash-up mechanism for over- or under-recovery of revenue.

Problem definition

173. This section explains the problem definition, including how it evolved through comments from submissions.

174. The pre-review 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. Vector and Maui Development Limited (**MDL**) were subject to a revenue cap that uses lagged quantities. For the next regulatory period, we will implement the amended revenue cap for First Gas Limited which is the single GTB that now owns and operates the former Vector and MDL transmission networks.

175. The main issues raised by stakeholders in respect of the current revenue cap for GTBs are:

175.1 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.

175.2 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 Commission's view in its previous decision, that GTBs had limited ability to control demand, remained sound.[101]

[101] Commerce Commission "Input methodologies review – gas pipeline default price-quality path reset 2017-

175.3 The Major Gas Users Group (**MGUG**) claimed that the lagged-quantity revenue cap exposes customers to the majority of risks that GTBs face,[102] and that as a result gas customers are being exposed to increasing prices as volumes decline. We consider that gas transmission demand is volatile and difficult to forecast,[103] and is often impacted by factors that are out of supplier's control (such as commodity prices) and therefore suppliers are not well 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. These reasons are explained more fully in the solution section below.

176. 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 which is not in the long term interests of consumers. We have considered how best to address these problems.

Solution: Adopt a 'pure' revenue cap for GTBs

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

Our solution

178. Our 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:

178.1 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));

178.2 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

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Gas stakeholder meeting – 8 December 2015 – Summary of views" (22 December 2015), para 41.

[102] MGUG's submission on the problem definition paper "Re: Input methodologies review" (21 August 2015), para 15; and MGUG submission "Input methodologies – Draft decision" (4 August 2016).

[103] The volatility of demand on the transmission network is clear in Figure 2 in Concept report 'Long term gas supply and demand scenarios'; showing significant volatility in the power generation and petrochemical sectors which are located on the transmission pipelines.

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

178.3 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)).

179. We have also decided that the revenue cap will include an annual unders and overs wash-up mechanism with implementation features intended to:

179.1 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

179.2 reduce the risk that consumers are exposed to price shocks.

180. 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 consider that 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).

181. 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.

182. We consider that this should no longer be a concern because First Gas Limited now owns and operates the former Vector and MDL transmission networks and is working to align the operating codes for the two gas transmission pipelines. We also consider that removing the choice of form of control for GTBs from the IMs would provide more certainty for stakeholders.[104]

183. We have amended 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

[104] Although it was not raised by gas stakeholders specifically, in response to our problem definition paper electricity stakeholders said that 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.

the wash-up mechanism.[105] The amendments have been drafted to reflect the changes:

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

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

Reasons for our solution

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

185. We considered the pros and cons of changing the form of control for GTBs from the following aspects:[106]

185.1 incentives for efficient expenditure;

185.2 price stability; and

185.3 incentives for pricing efficiency and tariff restructuring.

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

Incentives for efficient expenditure

187. 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. Therefore we do not consider it is efficient for GTBs to manage the uncertainty surrounding changes in demand as it is too difficult for the GTB to take meaningful actions to mitigate. 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)).

[105] The Report on the IM review captures the changes we will make to pre-review decisions as a result of our solutions.

[106] These aspects were chosen because they align with the purpose statement set out in s 52A.

188. We chose to apply a revenue cap for GTBs in 2013 for the same reasons. We explained that specifying a maximum revenue for transmission is more appropriate than specifying a maximum price because of the difficulties forecasting changes in revenue. In our 2013 gas DPP reset reasons paper we focussed on the reasons for a revenue cap for Vector Transmission as there was no disagreement that a revenue cap was appropriate for MDL. We explained:

> To set a maximum average price, we require a forecast of revenue growth, which is difficult to forecast for Vector Transmission. This is because about half of its revenue relates to the quantity of gas transported, and the other half to reserved capacity. Neither of these can be forecast with a reasonable degree of accuracy. This is because:
>
> the billed quantities of gas transported on the Vector Transmission pipeline are too variable to be predicted with a reasonable degree of accuracy;
>
> it is not clear what the change in reserved capacity will be over the regulatory period.
>
> Because we are not able to forecast these values reasonably accurately, allowed revenues may be significantly higher or lower under a weighted average price cap than required by the business. By contrast, the application of a revenue cap means that each supplier's revenues will reflect costs that are relatively straightforward to predict.[107]

189. 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.[108] MDL and First State Investment responded in cross submissions to our gas DPP process and issues paper, stating that they disagreed with MGUG.[109] 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.[110] For the bulk of transmission demand the driver is the ratio between the price of gas and the price of methanol, or electricity, or urea; the transmission fee is only a fraction of this, and so any change in transmission pricing would have a small impact in comparison to changes to the wholesale price of gas.[111]

190. In response to our draft decisions, MGUG said that it did not think our reasoning was based on evidence and that our view that gas transmission is difficult to forecast was

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107 Commerce Commission "Setting Default Price-Quality Paths for Suppliers of Gas Pipeline Services" (28 February 2013) Attachment F.

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

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

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

111 MDL "Untitled cross-submission on gas DPP process and issues paper" (13 April 2016), p. 2.

unsubstantiated.[112] To address this concern we have elaborated below on the thinking that we presented in the draft decision paper. We consider gas transmission to be difficult to forecast for two main reasons; the type of consumers of gas transmission services and the links with commodity prices.

191. GTBs have a small number of large consumers, mainly petrochemical plants, power stations, and other industrial scale consumers (compared to GDBs that generally have a large number of smaller consumers). This customer profile makes forecasting of demand difficult because the actions of one consumer will have a significant impact on the business and those actions are not easy to predict. MGUG has previously suggested that GTBs could rely on consumer forecasts,[113] however industrial consumers themselves may not foresee demand trends in advance either and they can be incentivised to forecast high to reduce their input costs.[114]

192. In addition, we consider that gas transmission demand is very closely linked with commodity prices and the cost of generating electricity from other sources, both of which are out of the control of a GTB and cannot be forecast with a sufficient degree of reliability.[115] This makes it difficult for a supplier to manage the demand risk when it is influenced by factors outside its control.

193. MGUG suggested that a GTB should also be incentivised to grow demand on its network (similar to gas distribution) and therefore a WAPC is more suitable because it provides that incentive. We consider that under a revenue cap there is still a natural incentive for GTBs to attract new customers because it would help mitigate the risk for them that a big customer leaves the network and costs are spread among fewer remaining consumers that are not able to make up the shortfall in costs. It would also help GTBs keep costs lower for all customers which may help prevent some customers from leaving the network.[116]

194. As gas transmission demand is subject to significant variability[117] 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 s 52A(1)(a) and (b)).

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112 In response to our draft decision paper, MGUG also commented on the CPRG workshop that was run as part of the gas DPP process; any comments on the workshop will be addressed through the gas DPP CPRG process.

113 MGUG submission "Input methodologies – Draft decision" (4 August 2016).

114 MDL "Untitled cross-submission on gas DPP process and issues paper" (13 April 2016), p. 2.

115 Concept Consulting "Long term gas supply and demand scenarios – 2016 update" (5 October 2016).

116 This issue is linked to discussions presented in the Cost of capital issues paper. Commerce Commission "Input methodologies review decisions: Topic paper 4 – Cost of capital issues" (20 December 2016).

117 Concept Consulting's report on Long term gas supply and demand scenarios shows significant volatility in the power generation and petrochemical sectors which are located on the transmission pipelines. Concept Consulting "Long term gas supply and demand scenarios – 2016 update" (5 October 2016) Figure 2.

195. 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

196. As explained for EDBs, a pure revenue cap could mean more price volatility within a price control period compared to a WAPC. In response to our draft decisions Oji Fibre Solutions gave the example of consumers bearing the volume risk and gas transmission charges increasing in a year by approximately $1m pa.[118] 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.

197. We consider that the pure revenue cap will create less price shocks than the current revenue cap by introducing the wash-up mechanism to target this concern. We are also including a constraint on average price changes to address stakeholders' concerns about large positive price shocks for consumers when demand significantly changes (the cap will only bind on large price increases, and will not prevent large reductions in prices which we do not consider as a concern for consumers).[119]

Incentives for pricing efficiency and tariff restructuring

198. The current revenue cap design using lagged quantities creates a barrier to suppliers offering more innovative tariffs or implementing auction-based pricing. This barrier is created because establishing a reasonable estimate of a historic lagged-quantity that corresponds to a restructured price can be a complex task, for example potential issues exist where a GTB has not been recording the quantity information which corresponds to the restructured price.

199. MGUG commented that there is currently no demand for a capacity product on the Maui system, nor is one anticipated in the medium term.[120] However, capacity products are being considered as part of the Transmission Pipeline Access work by the GIC and First Gas,[121] and we consider that capacity products will be more of a possibility (and there could be more demand for such products) following alignment of the pipeline operating codes.

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118 Oji Fibre Solutions cross submission on IM review draft decisions papers "IM review cross submission non-capital items" (18 August 2016), p. 2.

119 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); and Oji Fibre Solutions cross submission on IM review draft decisions papers "IM review cross submission non-capital items" (18 August 2016).

120 MGUG submission "Input methodologies – Draft decision" (4 August 2016).

121 First Gas "Gas Transmission Access: Single Code Options Paper" (28 November 2016).

200. 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

201. 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.

202. Price stability is also an important aspect 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 shocks (ie, a limit on average price increases).

Design of the amended revenue cap for GTBs

203. This section explains how the amended revenue cap and wash-up mechanism would work for GTBs.

204. 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.

205. The features of the wash-up mechanism are the same as the features described earlier for EDBs (Chapter 2). For GTBs we consider that the limit on average price increase feature 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 limit on average price increase will limit the short-term impact of a demand shock on consumers, although ultimately consumers will have to make up the full amount in the long term. For GTBs we will not provide for the "cap on accumulation of voluntary undercharging" feature which has been included in the EDB IM. This feature is designed only to mitigate the risk of EDBs deliberately under-pricing and building up a large credit balance.

Capacity auctions

206. 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.[122]

[122] 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.

207. 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 draw down 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.

Chapter 4: Form of control for GDBs

Purpose of this chapter

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

Structure of this chapter

209. This chapter explains:

209.1 why we considered changing the form of control for GDBs but have decided to maintain the WAPC for GDBs; and

209.2 why we suggested amending the specification of price IM for GDBs to allow the wash-up of pass-through and recoverable costs and why we have decided not to implement this proposed change.

We considered the benefits of moving GDBs to a revenue cap

210. This section explains why we considered changing the form of control for GDBs.

211. The framework for the IM review was to focus on identified problems with the IMs. 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.

212. Stakeholders highlighted that we needed to consider the differences between the electricity and gas (distribution) sectors. The key difference is that gas is a somewhat more discretionary fuel for the majority of consumers which gives suppliers an incentive to drive volumes to increase their revenues. This incentive is best accommodated under a WAPC.

213. Although quantity forecasting was raised as a significant issue for EDBs, it has not been highlighted as a specific problem to date under the WAPC by GDBs. MGUG noted in its submission on our draft decision that just because it has not been raised does not mean that it is not an issue.[123]

214. 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

[123] MGUG submission "Input methodologies – Draft decision" (4 August 2016).

be refined.[124] We have engaged with stakeholders regarding CPRG forecasting as part of the gas DPP process, including a CPRG workshop which we held with stakeholders in May. Our gas DPP draft decisions will be published in February 2017.

215. 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.

We will maintain a WAPC for GDBs

216. We will maintain a WAPC for the form of control for GDBs and continue to use lagged quantities. Our reasons for this decision are:

    216.1 unlike for EDBs, we do not have any significant concerns about continuing to use CPRG forecasting for GDBs;

    216.2 unlike for EDBs, we do not think the WAPC creates concerns about tariff restructuring or efficient pricing for GDBs; and

    216.3 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.

217. As we explain further below, we considered altering 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. However, after reflecting on submissions on this topic, we consider that this approach would add unnecessary costs and complexity for GDBs without much added benefit.

Reasons for not changing the WAPC for GDBs

218. This section explains our assessment of the form of control for GDBs and our reasons for maintaining a WAPC.

219. We considered the pros and cons of changing the form of control for GDBs from the following aspects:[125]

    219.1 connection incentives;

    219.2 incentives for efficient expenditure;

    219.3 incentives for pricing efficiency and tariff restructuring; and

    219.4 price stability.

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[124] Powerco "Submission on the four emerging view papers (29 February 2016)" (24 March 2016), para 20.

[125] These aspects were chosen because they align with the purpose statement set out in s 52A.

220. These are the same aspects that we considered the form of control for EDBs against, except that one of the aspects that was relevant to EDBs is not relevant here. The reasons why we consider these aspects are important are noted in the EDB chapter and so are not repeated here.

Connection incentives

221. Our main reason for 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 customers, gas demand consumers have more choice because they can choose whether to use gas and electricity or only electricity for their energy supply.

222. We consider that 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 making sure 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.

223. Concept Consulting's report on the relative long-term demand risks between electricity and gas networks indicated that the more discretionary nature of gas versus the essential nature of electricity has been reflected in rates of customer connection/disconnection to the respective networks.[126] 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 somewhat more discretionary fuel.

224. Stakeholders are also supportive of maintaining the WAPC because it incentivises GDBs to promote gas consumption and new connections between resets.[127] 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.[128] MGUG explained that generally distribution demand is growing which makes a WAPC a logical choice for GDBs

126 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).

127 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).

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

because they can aim to outperform the price-path.[129] GasNet is also supportive of the WAPC because it is already in place and understood by GDBs, and is straightforward to audit and operate.[130]

Incentives for efficient expenditure

225. 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-quality paths are reset). A revenue cap would remove the quantity forecasting risk from both suppliers and consumers, but the risk of unexpected changes in demand would be borne by consumers within the regulatory period.

226. Vector noted that, although the Commission's CPRG forecasts for GDBs to date have not provided cause for concern, there are "significant challenges for forecasting CPRG for GDBs". We acknowledge that forecasting demand is challenging, however we believe our approach to forecasting CPRG remains fit for purpose and we do not have any significant concerns about continuing to use CPRG forecasting for gas distribution. As a result we do not believe there is a significant concern that the WAPC is creating incentives for under-investment for GDBs.

227. 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 circumstances by promoting gas.[131] 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.[132]

228. MGUG commented that "we see no distinction between GDB and GTB customers with regard to demand risk".[133] It claimed that "arguing that GDBs have the ability to influence the uptake of gas because they can promote gas to people not connected to an existing network but somehow GTBs can't do the same, ignores the similarities and interdependencies of GTB and GDBs".[134]

229. We consider that GDBs do have more influence over demand than GTBs. GTBs have a small number of large customers and the demand for gas through transmission services is subject to factors that are outside the suppliers control, including commodity prices and the cost of generating electricity from other sources. Whereas

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

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

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

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

133 MGUG submission "Input methodologies – Draft decision" (4 August 2016) para 23.

134 MGUG submission "Input methodologies – Draft decision" (4 August 2016) para 23.

we consider that GDBs can influence gas demand through working with retailers and liaising with subdivision builders to influence new gas connections. For example, GasNet is currently growing its network and installing gas pipes in housing developments in the Bay of Plenty.[135]

230. We consider that 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 try to outperform the price-path. This would be a benefit for consumers by creating an incentive for GDBs to offer gas connections to new customers that may have not previously considered gas as an option.

Incentives for pricing efficiency and tariff restructuring

231. 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.[136]

232. In its Consumer Energy Options report,[137] 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 prices to mitigate this volatility. It suggests that fixed charges may not promote efficient usage decisions because gas is a somewhat discretionary fuel for most customers.[138]

233. However, Concept Consulting 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

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135 GasNet www.gasnet.co.nz (Viewed on 7 December 2016).

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

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

138 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.

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.[139] Therefore, we do not consider that the current implementation of the WAPC for GDBs disincentivises GDBs from introducing efficient price structures.

Price stability

234. 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

235. In weighing up the above aspects from which we considered the form of control for GDBs, we consider that the incentives on connections is important for gas distribution. This is because gas is a somewhat more 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

236. We will maintain the same WAPC design as is currently in place for GDBs and continue to use lagged quantities.

237. As part of our draft decision we proposed 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 trail to an invoice, a local authority rates notice or similar source document for the cost to be taken into account when pricing.

238. We suggested that an advantage of this proposed change would be that pass-through and recoverable costs would be more accurately reflected in prices earlier than they are in the current regime.

239. In response to our draft decisions Powerco and Vector submitted that, because the quantities of pass-through and recoverable costs involved for GDBs are much lower

[139] Concept Consulting "Consumer Energy Options in New Zealand – 2016 Update" (7 March 2016), p. 52.

than for EDBs, the additional complexity and compliance costs of this approach are not warranted for GDBs.[140] On the other hand, GasNet supported the pass-through balance approach.[141] In its cross submission First Gas explained that it did not have a firm preference on which approach should be applied, but noted that it appreciates the views from Vector and Powerco as they both own EDBs and therefore have experience applying the proposed approach.[142]

240. After considering submissions we agree that the proposed draft decision to adopt a pass-through balance approach for GDBs is likely to add unnecessary complexity for GDBs without much added benefit, and therefore we have decided to maintain the existing ascertainable approach to pass-through and recoverable costs.

[140] Powerco "Submission on input methodologies review – Draft decisions" (4 August 2016); Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016).

[141] GasNet "Submission on input methodologies review draft decisions papers" (1 August 2016).

[142] First Gas "Cross-submission on input methodologies review draft decisions (excluding cost of capital)" (18 August 2016).

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

Purpose of this chapter

241. 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 our approach protects the regulatory value of suppliers' investment in real terms.

Structure of this chapter

242. 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 significant problem, and so we do not propose to make any changes in this area.

Issues raised by suppliers

243. Topic paper 1 of the draft decision explains and clarifies how RAB indexation to inflation works, and what the impact is on returns and exposure to inflation risk.[143] 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.

244. Submissions to the draft decision outlined three inter-related concerns with our current approach:

    244.1 The possibility that our inflation forecast (which is based on the Reserve Bank's forecast[144]) differs from the market's expectation of inflation at the time of the WACC reset. If our forecast over-estimates inflation relative to the market estimate implicit in the WACC, then the real return we allow the businesses will be too low, violating the NPV = 0 objective. Submitters proposed that this concern be addressed by adopting a different forecast approach, or by targeting a nominal return.

    244.2 Even if our forecast of inflation is consistent with market expectations at the time we set WACC, out-turn inflation may differ from forecast. In these circumstances, our approach ensures that real FCM (*ex-ante* and *ex-post*) applies collectively to the providers of capital (debt plus equity). However, equity providers are exposed to inflation risk to the extent that debt is issued in nominal terms. Submitters proposed that this concern be addressed by

143 Commerce Commission "Input methodologies review draft decisions: Topic paper 1 – Form of control and RAB indexation for EDBs, GPBs and Transpower" (16 June 2016), Attachment A.

144 For example: *Electricity Distribution Services Input Methodologies Amendments Determination 2016* [2016] NZCC 24, clause 4.2.3.

targeting nominal FCM.[145] We also note that the risk could also potentially be addressed by businesses issuing inflation-linked debt/swaps.

244.3 A suggestion that our inflation forecasts are upwardly biased, which means the risks outlined above do not wash out over a number of regulatory periods.

245. As we explain in this chapter, we do not consider the issues raised to be significant problems, and therefore are not making any IM changes in response.

How stakeholders have articulated the issues

246. 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.

247. There appear to be a range of views on whether we should be targeting a real or nominal return. For example Vector, has consistently suggested that a nominal return is most appropriate and that suppliers should not be exposed to inflation forecasting risk. For example, Vector's February 2016 submission on the WACC update paper says:[146]

> 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.

248. A number of other suppliers submitted in response to the draft decision that they had concerns about the provision of a real return, given that their debt payments are generally fixed in nominal terms.[147] For example, the ENA provided a view that:[148]

> The ENA considers that the Form of control paper under-states the problems with nominal debt being funded through real returns. The objective should be to reflect the efficient and achievable debt management practices of a prudent and efficient EDB. This is compromised by the provision of real revenues to fund nominal interest costs. While the bankruptcy risk is low, bankruptcy is of course an extreme outcome. More likely there will be a mis-match between the real returns and the nominal debt

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

146 Vector "Input methodologies review – Update paper on the cost of capital topic" (9 February 2016), para 5. See also: Vector "Vector "Submission to Commerce Commission on the default price-quality paths from 1 April 2015: Process and issues paper" (30 April 2014), para 6-7.

147 Orion "Submission on input methodologies review – draft decisions" (4 August 2016), para 92; PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers – Made on behalf of 17 Electricity Distribution Businesses" (4 August 2016), para 22.

148 ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016), para 71.

> costs as the nominal compensation will only match the EDB's nominal interest costs if the inflation forecast equals actual inflation. As explained by CEG, delivering a nominal return but maintaining an indexing approach would require us to use forecast CPI when rolling forward the RAB between regulatory periods:
>
> That is, the IMs could be amended to target a nominal return on capital simply by rolling forward the RAB between regulatory periods using the same CPI forecast values used in the Commission's financial model at the beginning of the regulatory period.

249. Powerco submitted an alternative view to other suppliers and noted that in general terms they supported our existing approach.[149]

250. A secondary aspect of submissions to the draft concerned our approach to inflation forecasting in the event that we maintained our existing approach to providing a real return. A number of suppliers suggested that inflation forecasts have a significant impact on the real returns earned by suppliers to the extent that they are biased upwards.

251. In particular, there was concern that the CPI forecast used to estimate revaluation gains (ie, based on the RBNZ forecast/target) can be inconsistent with the inflation that is inherent in the nominal WACC estimate (which is unobservable). For example, Vector note that:[150]

> Vector is concerned about the presumption of symmetry between the inflation presumed in the market forecast embedded in the nominal WACC estimate and reversed out in the RAB revaluation income. Where the RBNZ's forecast for inflation is greater than the inflation inherent in the *ex-ante* WACC estimate, suppliers are effectively over-penalised for the double counting of inflation.

252. They also consider that the risk of forecasting error does not wash out over a number of regulatory periods if those forecasts are consistently biased in one direction. For example the ENA noted that:[151]

> In its Bulletin of June 2016, the Reserve Bank provides details on a review of its forecasting performance since the start of this decade. The paper shows that although the RBNZ compares favourably to other forecasters, there is a persistent bias towards over-forecasting CPI. This bias has proved and continues to prove significantly detrimental to equity investors, because all CPI forecast error is concentrated on equity investors because debt is issued in nominal terms.

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149 Powerco "Submission on input methodologies review – Draft decisions" (4 August 2016), para 91.

150 Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), para 43.

151 ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016), para 73.

253. A solution suggested by Vector was to take into account 'market-based' inflation forecasts rather than relying on the RBNZ-based forecasts:[152]

> At a minimum, the Commission must improve its approach to inflation forecasting by taking into account market expectations of inflation. The Commission's forecast should include market based instruments for inflation such as index-linked government bonds. We see significant risk with the Commission relying on the RBNZ's inflation forecast given the history of over-forecasting inflation since the global financial crisis and decoupling with market expectations for inflation.

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

254. In relation to RAB indexation and inflation risk, we consider that there was a lack of understanding of:

254.1 our policy intent;

254.2 our approach to implementation; and

254.3 the outcomes that our approach produces.

255. We have considered submissions put forward by suppliers and consider that no change is needed. We provide our reasons for this position in this chapter.

256. Although we have not made any changes to our approach, we agree that there is a small risk to suppliers in the event that our forecast of inflation is biased or inconsistent with the inflation inherent in the WACC. However, we consider that:

256.1 there is limited evidence that our inflation forecast, based on the RBNZ forecast and target level, is systematically biased. Alternative (market-based) approaches suggested in submissions have their own problems which mean that they are unlikely to provide a more accurate forecast of inflation; and

256.2 no alternative approach to RAB indexation has been suggested that fully maintains the inflation protection provided by the current approach and also removes the potential for forecasting error.

257. Our approach also exposes equity holders to some risk that they will not achieve a real return when inflation outcomes are different to forecast and the supplier has issued debt in fixed nominal terms. This is true even if our inflation forecast and the forecast inherent in the WACC are aligned. However, we consider that:

257.1 over the long-term this risk is small and will wash out over time if the forecast of inflation is unbiased; and

[152] Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), para 50.

257.2 the risk does not expose affect equity and debt holders collectively (ie, the total return to all capital is an *ex-post* real return) and suppliers can potentially manage any inflation risk to some extent through their debt-financing practices.

258. We do not consider that any of these risks are sufficiently large to justify a change in approach, given the likelihood that any forecasting errors will wash out over a number of regulatory periods.

Provision of a real return

259. The draft decision paper explained our policy intent to deliver real FCM and that the existing IMs achieved that policy outcome.[153] This was clarified in Attachment A of that paper and is consistent with our overall framework for the IM review.[154]

260. Our policy intent is to provide suppliers with 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.

261. 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). This results in an outcome where both consumers and suppliers are protected from inflation risk.

262. However, to the extent that suppliers issue nominal debt, equity holders may be exposed to a small risk when out-turn 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.[155]

263. 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. As noted above, there is a trade-off between targeting real returns and the exposure of suppliers to forecast risk. On balance we still consider that the benefits of targeting prices that are flat in real terms outweigh costs associated with a supplier's exposure to forecast risk.

153 Commerce Commission "Input methodologies review draft decisions: Topic paper 1 – Form of control and RAB indexation for EDBs, GPBs and Transpower" (16 June 2016).

154 Commerce Commission "Input methodologies review decisions: Framework paper" (20 December 2016).

155 In this case, while the firm receives an *ex-post* real return, equity holders receive less than a real return while debt holders receive more than a real return.

264. 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. [156] We also consider that aggregate pricing that is flat in real terms over time is consistent with allocative efficiency in workably competitive markets.[157]

265. 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.

266. We have sought advice from Dr Lally, who agrees that our approach and the outcome it delivers is consistent with our policy intent (ie, to deliver a real return). This ensures 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'). 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.[158]

267. Overall, Dr Lally concludes that:[159, 160]

> 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 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.

268. A potential problem with the current arrangements is the bankruptcy risk due to a mis-match between a supplier's debt payments fixed in nominal terms and the real returns provided for in the regulatory allowance. 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 mitigate it (eg, by

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156 Commerce Commission "Input methodologies review draft decisions: Topic paper 1 – Form of control and RAB indexation for EDBs, GPBs and Transpower" (16 June 2016), Attachment A.

157 Commerce Commission "Input methodologies (electricity distribution and gas pipeline services) reasons paper" (22 December 2010), para 5.2.6.

158 Commerce Commission "Input methodologies review decisions: Framework paper" (20 December 2016)

159 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 out-turn inflation.

160 We note that although Dr Lally agrees that that our approach is consistent with our policy intent, he recommends an alternative approach which does not deliver *ex-post* real returns to the supplier. We discuss this additional advice from Dr Lally in para 281-286.

issuing inflation-indexed debt). Therefore, we consider that it does not warrant an IM change. In this respect, Dr Lally concludes that:[161]

> 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.

269. Furthermore, we consider that the residual bankruptcy risk associated with the issuance of nominal debt is small. Also because actual inflation can be above or below forecast the risk to supplier's is broadly symmetric.[162] It is likely that suppliers can either bear this risk, or potentially manage it to some degree (eg, by issuing inflation-indexed debt).

270. We consider that supplier's claims that they may over- or under-recover when inflation out-turn and forecast differ suggest that they do not agree that real FCM should be our underlying principle.[163] We consider that our approach ensures that capital holders collectively are made whole in real terms, which is more consistent with expectations in a workably competitive market.[164]

271. Here is how we see the impact of inflation on revenues and RAB revaluations, which ensure that suppliers are made whole in real terms:

271.1 revenues: when out-turn inflation is lower (higher) than forecast, their nominal revenues are unchanged, while their real revenues are higher (lower); and

271.2 RAB revaluations: when out-turn 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.

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161 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.

162 Bankruptcy is not a symmetric matter.

163 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.

164 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 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).

272. Because the expected revaluation gains are deducted from allowed income in setting the price-quality path, the result is that the revenue/price-quality 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 out-turn inflation over the DPP/CPP period to the estimated real cost of capital at the beginning of the DPP/CPP period.[165]

273. We agree that our approach does expose a suppliers' nominal cash-flows to the risk that inflation differs from forecast. However, this is consistent with the policy intent as described in paragraphs 259-265. Protecting those nominal cash-flows would require a change to the overall policy. Submissions from suppliers do not seem to have any consensus on whether this is appropriate with the ENA, suggesting:[166]

> The ENA does not have a strong view on whether a real or nominal return is most appropriate for EDBs.

274. There is some confusion on this issue because some of suggested changes outlined by the ENA (see para 278) would result in the provision of nominal compensation but they are not explicitly linked to a recommendation to change the policy intent.

Exposure to inflation

275. A number of submissions considered that the current approach exposes suppliers to inflation risk. There appear to be three main concerns, as outlined in para 246-253:

275.1 First, that the risk that equity holders do not achieve a real return ex-post is too significant for a supplier to bear and means that equity holders will not achieve a real return;[167]

275.2 The CPI forecast we use to forecast revaluation gains is not consistent with the 'market-based' inflation forecast inherent in the WACC;[168] and

275.3 The CPI forecast we use is upwardly biased which means the exposure to inflation risk does not wash out over a number of regulatory periods.[169]

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

166 ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016), para 66.

167 For example, ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016), para 80; Unison "Submission on the input methodology review" (4 August 2016), para 52.

168 Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), para 43.

169 ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016), para 76; Unison "Submission on the input methodology review" (4 August 2016), para 53.

276. The 'equity holder risk' risk occurs because suppliers tend to issue debt that is fixed in nominal terms, whereas we provide an allowance for a real return, taking into account out-turn inflation. We have recognised this risk, but we do not consider it can be eliminated unless we provide a nominal return to debt-funded capital.[170]

277. The ENA have characterised this risk as the danger that equity holders will not expect or achieve a real return:[171]

> The more important consideration is the effect on the risks imposed on equity holders, given debt is issued by EDBs in nominal terms, but cash-flows provide for recovery of a real WACC in the short-term. This means that equity-holders are forced into earning less than the real required return on equity in the short-term, with a hope that CPI inflation will at least match the RBNZ's forecast so that the NPV≥0 criterion is met in the longer term.

278. They suggest four options to reduce the risk to equity holders:[172]

> While the ENA does not have a preferred solution to this issue, we note the following options are available:
>
> - Progress methods to improve the Commission's forecasts; potentially including using inflation forecasts from multiple sources, not just RBNZ.17
> - Apply a wash-up for the difference between forecast and actual inflation within the price-quality path.
> - Apply revaluations at the rate of forecast, rather than actual, inflation (at least for non-exempt EDBs).
> - Move to use of a nominal WACC without RAB indexation or intermediate approaches where the RAB is indexed only for the proportion that is equity funded.

279. We disagree with the ENA's suggestion that equity holders are 'forced' into earning less than the real required return.[173] The equity holder will always have an *ex-ante* 'expectation' of a normal return, given an unbiased forecast. However if it is assumed that a supplier's debt arrangements are fixed in nominal terms then the '*ex-post*' return achieved by equity holders may be higher or lower than a real return.

280. This outcome is consistent with our general approach of providing an *ex-ante* expectation of a normal return but not guaranteeing an *ex-post* delivery of a normal return. Consistent with this approach we note that:

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170 For example, by using forecast inflation to index the RAB or washing up for the difference between actual and forecast inflation.

171 ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016), para 68.

172 ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016), para 78.

173 ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016), para 68.

280.1 assuming an unbiased inflation forecast, the risk to equity holders (driven by their choice to issue nominal debt) means potential for under- or over-compensation will reduce over a number of regulatory periods; and

280.2 firms have at least some degree of control of the debt-financing arrangements that could be used to reduce the exposure of equity holders to this risk.[174]

281. Following submissions on our draft decision we commissioned Dr Martin Lally to provide an updated report to consider those submissions. Although he rejected the majority of suggestions, he favoured Vector's and ENA's proposal to index the RAB using the expected (or forecast) inflation rate. This change would result in the provision of a nominal return to suppliers as described above.

282. Dr Lally makes this recommendation because he considers the advantages of using expected inflation to index the RAB outweigh the disadvantages, ie:[175]

> This has three advantages: it removes the bankruptcy risk to businesses arising from actual inflation being less than forecast inflation, it eliminates any violations of the NPV = 0 principle due to regulators' errors in estimating expected inflation, and it reduces the effort that needs to be devoted to correctly estimating the expected inflation rate because errors in doing so no longer induce violations of the NPV = 0 principle. The only drawback is that the RAB will evolve over time in accordance with expected inflation rather than actual inflation. Thus the real expenditures by consumers will be affected by inflation shocks.

283. Although we agree with the advantages and disadvantages described by Dr Lally, we have decided to maintain our existing approach because we place greater weight on protecting the real expenditures by consumers, and real FCM for suppliers, from inflation shocks.[176]

284. Dr Lally considers that the advantages and disadvantages of choosing either approach are small – given the tendency of errors to net out over a succession of regulatory cycles. The fact that a change in approach would only ever provide a small advantage gives greater weight to our decision to maintain the existing approach.[177]

285. Overall, although we recognise that there is some risk to equity holders, we have maintained our view from the draft decision that we do not think that this risk is sufficiently significant to convince us to change our overall approach which provides a real return. Furthermore, suppliers may be able to manage this risk through their

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174 We have previously noted how firm may have the potential to issue inflation-indexed or floating rate debt. See: Commerce Commission "Input methodologies review draft decisions: Topic paper 1 – Form of control and RAB indexation for EDBs, GPBs and Transpower" (16 June 2016), para 216.

175 Dr Lally's expert advice "Review of further WACC submissions" (report to the Commerce Commission, 23 November 2016), p. 22.

176 Although the impact of inflation shocks has been relatively benign in recent years, this may change in the future.

177 Commerce Commission "Input methodologies review decisions: Framework paper" (20 December 2016).

debt issuance practices. We therefore consider that suppliers, not consumers, are better placed to bear that risk.

286. We also consider the allowance of real returns is a more stable position in the long-term, as we consider that under alternative inflation environments, suppliers may be more favourable to our policy of providing a real return.

Forecasts of CPI

287. Although we consider the best approach is to consistently provide a real return, we have some sympathy with suppliers on their concerns over the forecast of inflation (CPI) used to forecast revaluation gains. If the forecast is wrong it can magnify the short-term exposure of equity holders (but still results in an *ex-post* real return to the supplier as a whole), and if it is inconsistent with the inflation forecast inherent in the WACC it can result in a permanent increase or decrease in the return provided to suppliers.[178]

288. To minimise these risks we want to use the best possible forecast of inflation and for it to be consistent with the inflation forecast inherent in the WACC. Our current approach is to use the RBNZ CPI forecast produced at the time closest to determination window used to estimate the risk-free rate and then trend to the mid-point of the RBNZ inflation target.

289. Some suppliers suggested that if we maintained our approach to providing a real return we should look to improve our forecasts of inflation to include 'market-based forecasts'. This is because they suggested that the RBNZ forecasts are biased and have a history of over-forecasting.[179] For example, Vector suggested that:[180]

> At a minimum, the Commission must improve its approach to inflation forecasting by taking into account market expectations of inflation. The Commission's forecast should include market based instruments for inflation such as index-linked government bonds. We see significant risk with the Commission relying on the RBNZ's inflation forecast given the history of over-forecasting inflation since the global financial crisis and decoupling with market expectations for inflation.

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178 Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), para 41-43.

179 ENA "Input methodologies review – Form of control and RAB indexation – Submission to the Commerce Commission" (4 August 2016), para 73; Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), para 48.

180 Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), para 50.

290. Although, it is clear that out-turn inflation has been below the RBNZ forecasts in recent years, we do not think this necessarily means the forecasts are biased. As noted by Dr Lally, if a longer timeframe is used (ie, since 2002) then average out-turn inflation is only marginally different to the RBNZ target.[181]

> …the forecast used by the Commission is a mix of the Reserve Bank's forecasts and the midpoint of the Reserve Bank's inflation target (2%), and the average inflation rate since this inflation target was adopted in September 2002 has been 2.1%. Thus, the inflation target appears to have the essential feature, and modifications to that forecast from use of the Reserve Bank's forecasts could be expected to improve it rather than undercut it.

291. As with any forecast there will be forecasting error, and although we do not consider a comparison of forecasts against outcomes is definitive, we have not seen any resounding evidence that the RBNZ inflation forecasts 'have had systematic errors over an extended period of time', as claimed by Vector.[182]

292. If there is an 'error' in the inflation forecast, this still results in a real return to the supplier as long as the same 'error' is included in the inflation forecast inherent in the WACC.[183] This reduces the impact of any potential over-forecasting of inflation by the RBNZ, as long as it is consistent with investor expectations of forecast of inflation inherent in the nominal WACC.

293. The ENA cite a paper in their submission which states that the RBNZ forecasts have performed well compared to other forecasts.[184] This suggests that there would be limited value in using alternative CPI forecasts, which are likely to be similar, or less robust than, the RBNZ forecasts. This limits the likelihood that market expectations are likely to significantly differ from than the RBNZ forecasts.

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181 Dr Lally's expert advice "Review of further WACC submissions" (report to the Commerce Commission, 23 November 2016), p.23.

182 Vector "Vector submission on the draft amended input methodologies determinations" (3 November 2016), p.8.

183 This is because any error in the forecast asset revaluation (which is netted off from the supplier revenue allowance and based on our forecast of CPI) would be offset by the same error in the return on capital allowance, which determined from the nominal WACC.

184 Reserve Bank of New Zealand, "Bulletin Vol. 79, No. 10" (10 June 2016). Available at: http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Bulletins/2016/2016jun79-10.pdf

294. Vector suggested that a better approach than using the RBNZ forecast would be to use forecasts of inflation that are implied from the yields of inflation-indexed bonds, which they suggest imply a 'market' forecast of less than 1%. Although this method is an alternative approach to forecasting inflation, we note there are a number of issues which mean that this does not necessarily provide a more appropriate estimate of inflation than the RBNZ forecasts. For example:

    294.1 The shortest dated NZ government inflation-linked bond matures in 2025.[185] Therefore any implied inflation would be an average over the period until the bond matures and would not necessarily correspond to the five-year regulatory period;

    294.2 Yields on nominal government bonds can include a premium for bearing inflation risk which can distort the implied inflation forecast; and

    294.3 Yields on CPI-indexed government bonds can include a liquidity premium, given the relative scarcity of this type of bonds. This can distort the implied inflation forecast.

295. In a low inflation environment, the difficulty in inferring inflation from the yields on different bonds becomes more difficult because the impact of the various premiums can significantly outweigh the actual level of inflation. We also note that the AER has previously moved away from 'market-based' inflation estimates to a central bank target, due to the unreliability of the forecasts and bond liquidity issues.[186] Further, we understand that the RBNZ takes into account 'market' forecasts/expectations in their inflation forecast.

296. Transpower also noted the difficulty in determining a forecast of inflation from bond rates:[187]

> In New Zealand, it is not possible to estimate reliably expected (implied) inflation embedded within the nominal WACC by, for instance, comparing the yields on nominal and inflation-protected government bonds. This is because inflation-protected bonds are very thinly-traded in New Zealand so the yields on those bonds will reflect, in part, an illiquidity premium and will not provide a 'pure' measure of the real risk-free rate

297. Given the issues associated with alternative inflation forecasting methods, we have decided not to move to an alternative approach in the IMs and will maintain the existing methodology. We are open to future improvements to our inflation forecasts. However, we do not consider that there are obvious enhancements that can be made to our current approach at this time.

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185 There are 3 CPI-indexed bonds currently on issue by the New Zealand Government. These mature in 2025, 2030, and 2035.

186 See AER "SP AusNet transmission determination 2008-09 to 2013-14: Final decision" (January 2008), p.88-89. Available at: https://www.aer.gov.au/system/files/AER%20Final%20decision.pdf

187 Transpower "IM review: Submission on suite of draft decision papers" (4 August 2016), footnote 24.

Weighted average approach

298. An alternative potential option put forward by CEG (on behalf of the ENA) would be to apply a 'weighted average approach' in which the compensation for the cost of equity would be based on a real return and compensation for the cost of debt would be based on a nominal return.[188]

299. This approach has some attraction in that it reduces the potential for equity holders not to achieve a real return. However, we have not been convinced to introduce the weighted average approach because we consider:

    299.1 It adds complexity to the overall approach both conceptually and in practice which is not justified by the existence of significant problems with the existing methodology.

    299.2 We consider that pricing that remains constant in real terms over time is consistent with allocative efficiency in workably competitive markets. A change in our approach which provides compensation for debt fixed in nominal terms would transfer inflation risk from suppliers to consumers. However, because debt-financing practice is in the control of suppliers we consider that it is most appropriate for suppliers to bear this risk, and be incentivised to undertake efficient financing arrangements.

We are not making any changes in this area

300. Submissions have outlined some of the short-term risks that arise from the interaction of inflation forecasts with our approach to RAB indexation. However, 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.

301. We continue to consider that providing an expectation of, and delivering (all else equal), real FCM promotes incentives to invest (consistent with s 52A(1)(a)). This approach protects the regulatory value of suppliers' investment in real terms. Further, our current approach to RAB indexation, as provided for in the IMs, is consistent with our policy intent. It delivers real FCM for capital holders collectively, protecting consumers and suppliers from inflation risk .

302. The only potential problems relate to the potential for equity holders to get less/more than a real return and the accuracy of inflation forecasting. We consider these risks to be relatively small, and they cannot be easily mitigated without a change in our policy intent. We have therefore decided not to make an IM change on our approach to RAB indexation for EDBs/GPBs.

[188] CEG, "Inflation: Revaluations and revenue indexation" (report prepared for ENA, February 2016), para 30-31.

Chapter 6: RAB indexation and inflation risk – Transpower

Purpose of this chapter

303. This chapter explains the issues we identified in relation to Transpower's exposure to inflation risk and the time profile of capital recovery.

304. It also discusses the possibility raised in the draft decision of applying an 'annual capital charge adjustment' for Transpower to reduce inflation risk and why we do not consider an IM change is warranted at this time.

Structure of this chapter

305. 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.

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

306. Stakeholders did not raise problems with the approach to RAB indexation and inflation risk that applied under the pre-review IMs for Transpower. However, we identified and considered the following issues, as part of our review of RAB indexation.[189]

Time profile of capital recovery

307. 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.[190]

Inflation risk

308. Our existing (un-indexed) approach for Transpower delivers *ex-post* nominal returns, which exposes both consumers and Transpower to the risk that out-turn inflation differs from the inflation expectation inherent in the nominal WACC used. We noted the possibility of eliminating this risk by creating an annual capital charge adjustment through the maximum allowable revenue (**MAR**) wash-up.[191]

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189 When setting the IMs in 2010,we noted that we would review the approach to RAB indexation for Transpower, when their investment requirement had reduced. See: Commerce Commission "Input methodologies (Transpower) reasons paper" (December 2010), para 4.3.12-4.3.15.

190 Commerce Commission "Input methodologies (Transpower) reasons paper" (December 2010), para 4.3.12-4.3.15.

191 Commerce Commission "Input methodologies review draft decisions: Topic paper 1 – Form of control and RAB indexation for EDBs, GPBs and Transpower" (16 June 2016), para 234-235.

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

309. On balance, we have decided to maintain the existing 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.

310. 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.[192]

311. 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.

312. We consider that these reasons justify maintaining a different approach than for EDBs.

313. Submissions from Transpower on this point were consistent with our decision.[193]

> We support the Commission's draft decision not to index Transpower's RAB. We consider this to be consistent with the Commission's position on emerging technology, and the draft decision to allow EDBs accelerated depreciation. We support the Commission's reasons against RAB indexation for Transpower.

314. In addition, support for our decision was provided by MEUG, though it was dependent on the development of the Transmission Pricing Methodologies (TPM).[194]

> MEUG agrees with the Commerce Commission's draft decision to retain the approach of not indexing Transpower's RAB to inflation. Our view might change depending on any future revision to the TPM.

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

[193] Transpower "IM review: Submission on suite of draft decision papers" (4 August 2016), p.8.

[194] MEUG "Submission on Input methodologies draft review decisions" (4 August 2016). para 14.

315. On the other hand, PwC submitted they did not understand why we apply a different approach for Transpower.[195]

> We appreciate the logic put forward in support of the current approach to RAB indexation. However, this is undermined by the application of a different approach to Transpower. We cannot see any principled justification for the regulatory regime to provide Transpower with a nominal return while it provides distributors with a real return.

316. Submissions have not persuaded us that we should change our approach to not indexing Transpower's RAB. We agree that this it is a different approach to EDBs but consider that the increased compliance and complexity that would be required to change the approach for Transpower do not justify the benefits in terms of protection from inflation risk. EDBs benefit from the ability to shorten asset lives, which can lead to the recovery of cash-flows earlier. This is broadly analogous to the use of an un-indexed RAB.

We are not proposing to introduce an annual capital charge adjustment

317. Although we have maintained our previous approach for Transpower – which is not indexing its RAB to inflation, as part of the draft decision we considered a possible change we could make to this approach which would deliver real FCM *ex-post* by way of an 'annual capital charge adjustment'.

318. Without this adjustment, our approach delivers *ex-post* nominal returns, which exposes both consumers and Transpower to the risk that out-turn inflation differs from the inflation expectation inherent in the nominal WACC used.

319. Following submissions we decided not to introduce the annual capital charge adjustment. This is because we consider it would be an additional complication that is unlikely to result in significant benefits to suppliers or consumers in the current low inflation environment.

Potential to deliver real FCM ex-post

320. The possible change was 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 proposed to create an annual capital charge adjustment through the MAR wash-up.

321. The adjustment would be equal to the difference between the actual and 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.

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[195] PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers – Made on behalf of 17 Electricity Distribution Businesses" (4 August 2016), para 109.

322. Transpower did not agree with the introduction of the proposed annual capital charge adjustment:[196]

> Although we appreciate what the Commission is seeking to achieve, we do not support the proposal "to create an annual capital charge adjustment through the MAR wash-up" in order to address inflation risk.
>
> We have not considered this issue in great detail and have discussed the matter only briefly with the Commission team. However, we agree with the Commission's suggestion that "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" , particularly given the regulatory complexity that this would add.

323. MEUG also considered that the cost of implementing the proposal may not outweigh any benefits:[197]

> in the future a re-alignment of a changed TPM and RAB IM is required (see discussion paragraph 10 v) above) it would likely make the proposed annual capital charge adjustment through the Maximum Allowable Revenue (MAR) wash-up obsolete. Given there will be a cost of implementing the proposal and no assessment in the draft decision of possible benefits (other than an open question for views on what those might be) plus uncertainty on if and how future integration of the RAB IM and TPM might evolve, MEUG has no basis to know if the proposal is beneficial or not.

324. After weighing up the trade-off between the cost of implementing the proposal and its known benefits, we have decided not to proceed with the annual capital charge adjustment for Transpower. Despite this we feel that there remains a valid argument for ensuring the delivery of real FCM for Transpower, consistent with our approach for EDBs, and do not rule out making a change in this area in future.

196 Transpower "IM review: Submission on suite of draft decision papers" (4 August 2016), p.8.
197 MEUG "Submission on Input methodologies draft review decisions" (4 August 2016), para 14.

Attachment A: Incentives for pricing efficiency and tariff restructuring

Purpose of this attachment

325. This attachment discusses some theoretical and practical considerations about efficient pricing under both forms of control – WAPC and revenue cap.

Practical considerations diminish theoretical concerns of revenue caps

326. Stakeholders have raised concerns associated with the incentives that a revenue cap would place on suppliers to price efficiently.

327. As part of our draft decision package we published a letter from the EA which explained its views on pricing efficiency under a revenue cap for EDBs.[198] As part of the EA's broader interest in EDBs' incentives to price efficiently, the letter set out some substantive questions regarding the impact of the form of control on pricing efficiency.[199]

328. The EA has raised a concern (also supported in the economic literature)[200] that EDBs might have an incentive to price inefficiently under a revenue cap. The issue raised is that under a revenue cap there is a risk of inefficient pricing as suppliers may over-price,[201] especially to price-sensitive customers to reduce costs. Suppliers might cause price-sensitive customers to reduce demand to defer investment inefficiently, therefore reducing costs for the supplier and maximising profit (as revenue is already agreed).

329. Our understanding of these concerns and underlying assumptions is as follows.

330. A key concern is that EDBs may set price(s) above the unregulated monopoly price under a revenue cap.[202] This would happen because the EDB can achieve the allowed revenue at two different price levels (solutions) – a low and a high price. The concern is that the EDB will choose the high price as this minimises costs, and thus maximises profits. Such an outcome relies on three assumptions that do not appear to be fully met in the context of regulating EDBs in NZ; therefore making this critique less concerning.

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

199 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.

200 Electricity Authority "Possible implications for efficient distribution pricing of a decision to change the form of control for electricity distribution businesses" (30 May 2016), page 3; and Steven Stoft, "Revenue Caps vs. Price Caps: Implications for DSM", (1995).

201 Prices that may exceed what an unregulated monopolist would charge.

202 This is often known as the Crew & Kleindorfer (C&K) critique of revenue caps. Our understanding is that it relates to average prices. Michael A. Crew, Paul R. Kleindorfer, "Price caps and revenue caps: Incentives and Disincentives for Efficiency", (1996).

331. First, it assumes that the dynamics of reaching the 'high price equilibrium' do not matter. In reality, we consider that they do matter. To reach that equilibrium, the EDB would likely require a large (potentially dramatic) and sudden price increase. This price increase is needed because the 'status quo' price under a WAPC will almost certainly be below the unconstrained monopoly level, while the 'high price solution' is above it.

332. If the EDB were to raise prices in such a way under a revenue cap, given lags in consumer response, revenue would likely significantly exceed the revenue cap for some time before falling to the allowed level (it may not fall as per the below elasticities discussion).[203] We expect that our wash-up mechanism would force prices back down by forcing the EDB to return the over-recovery to consumers in subsequent years in the form of lower prices. This would likely prevent the EDB from achieving the high equilibrium price.

333. In addition, there are other factors which will also weaken the validity of the assumption:

    333.1 first, the revenue cap will include a limit on the average price increase which would act as a constraint;

    333.2 second, the above-mentioned pricing behaviour would likely breach the EA's pricing principles; and

    333.3 other non-price constraints (eg media, public backlash) would likely make large, dramatic price increases unlikely.

334. Second, it assumes that at a high price level, demand and therefore revenue will fall. This requires high elasticities of demand, which appear unlikely for electricity demand unless prices are increased substantially (eg, electricity elasticity demand estimates we used in the WACC topic paper decision[204] ranged from -0.013 to -0.030 in the short-run and -0.044 to -0.157 in the long run).[205] Further, since line charges make up around one third of the final energy bill, the increase in EDB prices would have to be even higher.

335. Third, it assumes that costs fall with reductions in customers/volumes. This is what leads the firm to choose the high price equilibrium, as this maximises profits (ie, same revenue but lower costs). This has at least two associated concerns – an

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[203] It is possible that the EDB could reduce other prices at the same time in order to stay within the revenue cap. In practice, it appears unlikely that EDBs can price discriminate as flexibly and accurately as this would require.

[204] Commerce Commission "Input methodologies review draft decisions: Topic paper 4 – Cost of capital issues" (20 December 2016) Chapter 4.

[205] We note that elasticities can vary between different consumer groups, firms, the industry as a whole, and different price components (eg, fixed prices or time-of-use prices). Therefore, this assumption may hold more strongly for some consumer groups/firms or price components, and less strongly (or potentially not at all) for others.

incentive to reduce peak demand (potentially to inefficiently low levels, which could happen when price is not cost reflective) to avoid incremental costs, and an incentive to 'lose' customers (or incentives not to connect new customers), as every additional customer causes costs but does not increase revenue.

336. The model applies more to a vertically integrated utility that also generates electricity and so has higher variable costs,[206] but much less so for a largely fixed cost EDB. Although this seems largely true for sunk costs, the concern remains to some extent for incremental costs, where higher prices can reduce incremental costs.[207]

337. Regarding the 'peak demand' concern, EDBs may indeed have an incentive (at least within the regulatory period) to excessively reduce demand peaks throughout their networks as this would reduce a key cost driver.[208] However, this incentive is weakened when EDBs take a longer term view (in addition to the factors described in paras 331 and 334 above). This is because any investment that the EDB is potentially able to delay or avoid through over-pricing will not enter the RAB when prices are reset prior to the following regulatory period; which – other things equal – would result in lower allowed revenues and average prices for consumers. Furthermore, the EDB runs the risk that we reduce future expenditure allowances. Also, as we have noted in the past,[209] investors focussed on the long term may not support a strategy of running down the RAB.

338. In relation to the potential incentive to 'lose' customers (or incentives not to connect new customers) as discussed in paras 100 and 101, we consider that EDBs are sufficiently incentivised to connect new customers (eg, capex goes into the RAB plus cost recovery can be accelerated through capital contributions) and our ID requirements can 'shine a light' and induce good performance. Some submitters have also made the point that EDBs take a longer term view when setting prices, saying for example that "EDBs are businesses that invest in long-term assets and are concerned to ensure that they can recover their investments".[210]

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206 The context in the Stoft paper is that of a vertically integrated utility with higher variable costs. Steven Stoft, "Revenue Caps vs. Price Caps: Implications for DSM", (1995).

207 Electricity Authority "Possible implications for efficient distribution pricing of a decision to change the form of control for electricity distribution businesses" (30 May 2016), p. 3.

208 This concern relates to situations where prices are set to inefficiently high levels. Electricity Authority "Possible implications for efficient distribution pricing of a decision to change the form of control for electricity distribution businesses" (30 May 2016), p. 3.

209 Commerce Commission "Regulatory incentives and the cost of capital" (23 June 2014), p. 4.

210 ENA "Input Methodologies review – Topic paper 1, form of control and RAB indexation" (4 August 2016), para 41.

339. A final concern raised in the literature is that a revenue cap causes relative prices to move away from the Ramsey optimum;[211] that is, charge high price-cost mark-ups to more price-sensitive consumers or services and low mark-ups to less price-sensitive ones. This would happen because a revenue capped firm maximises profits in this way: reducing cost via price-induced falls in volumes. This results in lower total welfare.

340. This concern also appears to assume costs are sensitive to volumes. This is not strongly the case for EDBs, except for incremental costs as mentioned above. Further, it assumes that EDBs can price discriminate more flexibly than we understand they do in practice.[212] We note that EDBs' ability to price discriminate might increase over time, as a result of increasing availability of consumer data from smart meters (among other sources), coupled with increasing capabilities for data processing and analysis. However, other factors such as the extent/granularity of retailer pass-through of EDB prices might also mitigate this concern.

341. Nevertheless, this concern does not appear to consider all aspects of pricing efficiency. Ramsey pricing is primarily concerned with recovering sunk costs in the least distortionary manner (likely involving minimising reductions in sales/volumes/demand), rather than sending the right forward-looking pricing signals. So Ramsey pricing does not necessarily promote efficient investment outcomes. Having a higher price for price-sensitive consumers might be in fact be an appropriate signal in the event of capacity constraints. This might be the case where demand from these price-sensitive consumers is driving investment needs to meet peak demand.

342. A number of suppliers considered many of these concerns to be theoretical and overlook EDBs' actual business practices.[213] We conclude that these concerns that revenue caps give rise to may not apply as strongly in practice for EDBs, but some concerns may remain.

Compliance risks under WAPC pose barriers to price restructures

343. In choosing a WAPC for EDBs in 2010 we considered that in theory the WAPC should be expected to incentivise efficient pricing because regulated suppliers can utilise their knowledge of consumers' price responsiveness when pricing to maximise

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211 Often referred to as Ramsey-Boiteux pricing, it is a pricing rule that maximises total welfare (consumer plus supplier) under the constraint of non-negative profits for suppliers. It says that the price markup should be lower for price sensitive consumers and higher for consumers that are less price sensitive. So it assumes that suppliers can price discriminate. Steven Stoft, "Revenue Caps vs. Price Caps: Implications for DSM", (1995).

212 ENA "Input Methodologies review – Topic paper 1, form of control and RAB indexation" (4 August 2016), p. 13.

213 For a selection of views, see for example: Aurora "Cross-submission, Input Methodologies Review: Draft Decision and Determination Papers" (18 August 2016), p. 7

profits and manage demand risk – potentially reducing allocative inefficiency.[214] However, we have not seen this happening in practice to a significant extent.[215]

344. We note that this does not necessarily mean that the WAPC has 'failed' in providing incentives to price efficiently. What it probably means is that other factors and circumstances have presented even greater incentives in the opposite direction. It is hard to isolate the causal forces behind the relative lack of efficient pricing to date.

345. 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.

346. Stakeholders presented mixed views on this point. For example, 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.[216]

347. Similarly, Wellington Electricity considered that under a revenue cap EDBs would have positive incentives to move towards more cost reflective tariffs.[217] It suggested 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 suggested 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.

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

215 The Lines Company is the only EDB that has taken significant steps in tariff reform. We also note the ENA's November 2016 technical discussion paper on new pricing options for EDBs.

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

217 Wellington Electricity "Input methodologies review – Commission emerging views" (24 March 2016), p. 3.

348. Eastland also suggested that there are significant incentives within the industry to develop cost reflective prices and that the current WAPC is a disincentive to developing new pricing.[218] Also, Network Tasman commented that a revenue cap would be administratively easier for a pricing restructure than a WAPC.[219]

349. However, 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 it states is "a pricing mechanism that does not support efficient recovery of network costs and shifts the risk of over-investment".[220]

350. Prior to their latest announcement on next steps for the Distribution Pricing Review, 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, the 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.

351. We consider that our decision 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.

Other important incentives to make pricing more efficient

352. We consider 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.[221]

353. 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 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,[222] and therefore we consider that more scrutiny and/or prescription of EDBs' pricing approaches could be worthwhile for the substantial benefits available.

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218 Eastland submission on IM review draft decisions papers "Submission to the Commerce Commission – Input methodologies review" (4 August 2016).

219 Network Tasman "Submission on the input methodologies review consultation" (4 August 2016), p. 4.

220 MEUG "Submission on emerging views on form of control" (24 March 2016).

221 Castalia "Review of Electricity Distribution Businesses' 2013 Pricing Methodologies, Report to the Electricity Authority" (November 2013).

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

354. As part of its Distribution Pricing Review, the EA is focussed on facilitating an industry-led adoption of efficient distribution pricing. We note the concrete next steps that the EA has recently announced in this regard.[223] The EA expects each distributor to publish (before 1 April 2017) its plan for introducing efficient pricing, including an outline of the planned process including consultation with consumers and a timeline with key milestones.

355. The EA also intends to:

    355.1 monitor and report on distributor progress towards adopting efficient distribution price structures;

    355.2 review the current distribution pricing principles and associated information disclosure guidelines and consult on any proposed changes; and

    355.3 assess alignment of distributor prices against the distribution pricing principles (each year from April 2018).

356. We consider that the outcomes of the Distribution Pricing Review should provide additional incentives on EDBs to move to more efficient pricing; and should therefore help to offset the risk that the disincentives to price efficiently under a revenue cap are more significant in practice than the evidence before us suggests.

357. Lastly, emerging technology developments, which are independent of the form of control, increasingly present a threat for EDBs of some consumers self-supplying. Although we found inconclusive evidence of this risk increasing,[224] the growing uncertainty surrounding this risk can provide an incentive on EDBs to make their prices more efficient.

Conclusion

358. On balance, we consider that moving EDBs from a WAPC to a pure revenue cap would remove potential compliance disincentives on suppliers to restructure their tariffs to be more efficient (consistent with s 52A(1)(b)).

359. We consider that there are a mix of factors encouraging pricing efficiency,[225] which taken together, are likely to dominate over any potential diminished incentives to price efficiently under a revenue cap. These factors include EDB's longer term incentives to recover the cost of their investments; the nature of the sector's cost structure (ie, where fixed costs make up a significant proportion of the total); the dynamics of reaching the high price (which diminish the likelihood of a successful material price increase); relatively low price elasticities of demand; EDBs' limited

223 Electricity Authority "Market Brief – 25 October 2016" (25 October 2016).

224 Commerce Commission "Input methodologies review decisions: Topic paper 3 – The future impact of emerging technologies in the energy sector" (20 December 2016).

225 We note that some factors will positively encourage pricing efficiency but others may simply mean that any potential diminished incentives to price efficiently under a revenue cap do not hold in practice.

ability to identify price-sensitive consumers; the constraints placed by the design of the revenue cap; the EA's ongoing work on distribution pricing; emerging technology developments; and non-economic constraints on pricing such as public perceptions.