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Revised Draft Reset of the 2010-15 Default Price-Quality Paths

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Table of Contents

Executive Summary

X1. This paper explains why we propose to reset the default price-quality paths that apply to 16 suppliers of electricity distribution services.[1] You are invited to provide your views.

X.1 Submissions are due by **1 October 2012**.

X.2 Cross-submissions are due by **12 October 2012**.

X2. We expect to reach a final decision on these matters by 30 November 2012; price changes may therefore take effect from 1 April 2013.

Proposed reset of the current default price-quality paths

X3. The current default price-quality paths were set, on 30 November 2009, for 17 suppliers of electricity distribution services.[2] Each of these paths specifies the maximum price, and quality standards, that a supplier must comply with during the current regulatory period, ie, 1 April 2010 to 31 March 2015.

X4. As required under Part 4 of the Commerce Act 1986 (the Act), we had to set these paths prior to establishing the key rules, requirements and processes of regulation, which are collectively known as 'input methodologies'. At the time, we recognised that each supplier's path may be reset when input methodologies were available.

X5. Now, as part of the transition to the new regime, it is time to consider a reset:

X5.1 The last round of consultation in the process to re-determine input methodologies was in June 2012.

X5.2 The final re-determination of input methodologies is scheduled for September 2012.

X6. We would only reset a supplier's path if we were confident that the purpose of Part 4 would be promoted. In the first instance, we must be satisfied that a materially different path would have been set for the supplier, had input methodologies applied at the time.[3]

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1 Orion New Zealand will be considered separately due to the situation caused by the Canterbury earthquakes.

2 Refer: Commerce Commission, *Initial Reset of Default Price-Quality Path for Electricity Distribution Businesses Decisions Paper,* 30 November 2009.

3 Refer: s 54K(3) of the Act.

X7. In summary, our analysis indicates that a materially different path would have been set for each supplier, had input methodologies applied on 30 November 2009. This is because two key adjustments would have been made:

X7.1 As we noted when the paths were set, the price allowed in the first year of the regulatory period (starting price) would have been adjusted, based on the current and projected profitability of each supplier;[4] and

X7.2 The annual rate of change in price allowed during the regulatory period would also have been adjusted, to exclude the impact of the recent change in Goods and Services Tax (GST).[5]

X8. As a consequence, and to promote the purpose of Part 4, we propose to reset each supplier's path in accordance with the relevant statutory processes.

Significant rebalancing of prices across distributors—Less pronounced impact overall

X9. Our revised draft decision proposes a significant rebalancing of prices across electricity distributors, but there would be a less pronounced impact overall. The weighted industry average price increase in 2013/14 would be approximately 1%. In practice, however, the overall adjustment will be lower in 2013/14, as we have spread some price increases over more than one year.

Revenue expected in 2013/14 and allowable rates of change in prices

X10. The chart overleaf shows the amount of revenue that we would expect each supplier to recover through distribution prices in 2013/14 if our revised draft decision was implemented. It also shows the rate of change in prices that would be allowed on 1 April 2014, prior to any claw-back amounts being recovered.[6]

X11. The results reflect spreading the largest price adjustment over two years for some suppliers, to help minimise price shocks to their consumers. In some cases, we have proposed a cap of CPI+15%. No claw-back would be recovered in the years in which a price adjustment is spread and/or capped.

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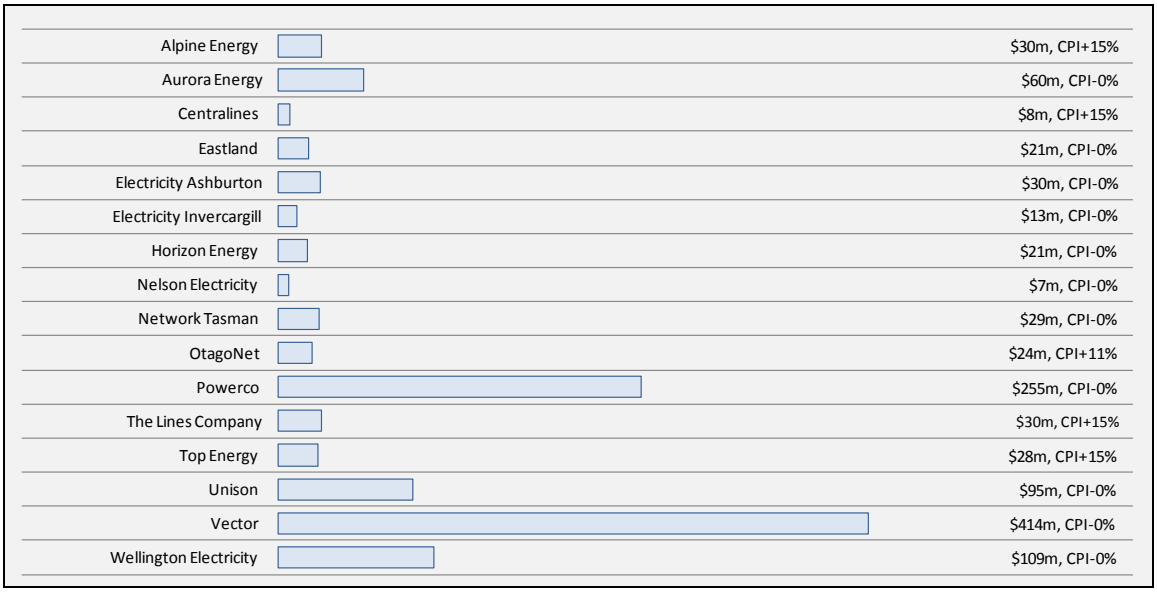
4 The supplier's starting price is important because it anchors the price changes that are allowed until the end of the regulatory period.

5 The rate of change is expressed with reference to changes the Consumer Price Index (CPI) in the form 'CPI-X', where X is a percentage differential known as the X factor. Excluding the impact of the October 2010 change in GST from the CPI would reduce prices by approximately 2%.

6 Guidance on how to interpret these figures is provided in paragraphs 84 to 87 of this paper. Notably, the figures may change following consultation, and do not reflect the likely impact on retail prices (which include transmission charges and the cost of generated energy). Nor do the figures reflect the likely impact on individual consumers, or groups of consumers, because suppliers are able to vary their pricing structure. We also note that our estimates are based on suppliers pricing in line with the price cap, which they may not be doing in practice.

Expected revenue in 2013/14 and allowable rate of change in price on 1 April 2014



Claw-back to neutralise the impact of the delay to price adjustments

X12. As provided for under the Act, we also propose to apply claw-back to ensure that all suppliers have the opportunity to earn a normal return from 1 April 2012. Therefore:

X12.1 For most suppliers, the amount to be clawed back would be equal to any over- or under-recovery in 2012/13, and would be recovered in 2014/15;

X12.2 For OtagoNet, the amount to be clawed back would be equal to the under-recovery in the 2012/13 year, but would be recovered in the next regulatory period; and

X12.3 For suppliers that are subject to a CPI+15% cap, the amount to be clawed back would be greater than the amount of under-recovery in 2012/13; however, these amounts will be recovered in the next regulatory period.

X13. Overall, we are satisfied that our revised draft decision reflects the purpose of Part 4. It would also neutralise the impact of the delay in applying input methodologies to each supplier's default price-quality path.

1. Introduction

Purpose of this paper

1. This paper explains why we propose to reset the default price-quality paths that apply to 16 suppliers of electricity distribution services. You are invited to provide your views.

   1.1 Submissions are due by **1 October 2012**.

   1.2 Cross-submissions are due by **12 October 2012**.

2. We expect to reach a final decision on these matters by 30 November 2012; price changes may therefore take effect from 1 April 2013.

Proposed reset of the current default price-quality paths

3. The current default price-quality paths were set, on 30 November 2009, for 17 suppliers of electricity distribution services.[7] Each of these paths specifies the maximum price, and quality standards, that a supplier must comply with during the current regulatory period, ie, 1 April 2010 to 31 March 2015.

4. As required under Part 4 of the Commerce Act 1986 (the Act), we had to set these paths prior to establishing the key rules, requirements and processes of regulation, which are collectively known as 'input methodologies'. At that time, we recognised that each supplier's path may be reset when input methodologies became available.

5. Since that date, we have put in place input methodologies; however, they cannot be applied to default price-quality paths until they are re-issued (or 're-determined') in September 2012.[8] The re-determination process is required because certain matters were not specified as applicable to default price-quality paths.

6. We consulted in June 2012 on the matters that must now be specified as applicable to default price-quality paths. In this paper, input methodologies for default price-quality paths, including those proposed in June 2012, are referred to as 're-determined input methodologies'.

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7 Refer: Commerce Commission, *Initial Reset of Default Price-Quality Path for Electricity Distribution Businesses Decisions Paper,* 30 November 2009. We do not propose to reset Orion New Zealand's default price-quality path at this time (refer paragraph 19 below).

8 The existing input methodologies were determined in December 2010, and will remain in place until we have completed the re-determination process. The re-determination will contain all the matters that were determined in December 2010 (as well as the proposed amendment to the input methodologies for estimating the cost of capital for default price-quality paths). However, we are required to conduct a re-determination so that the input methodologies for cost allocation, asset valuation, and the treatment of taxation are specified as applicable to default price-quality paths; refer: *Vector Limited v Commerce Commission* HC Wellington, 26 September 2011, Clifford J, CIV-2011-485-536.

A materially different path—Promoting the Part 4 Purpose

7. Once the re-determination process is complete, we would only seek to reset a supplier's path if it would better promote the purpose of Part 4 (Part 4 Purpose). In the first instance, we must be confident that a materially different path would have been set for the supplier, had input methodologies applied on 30 November 2009.[9]

8. Two key adjustments would have been made on 30 November 2009, had re-determined input methodologies applied at the time:

   8.1 The price allowed in the first year of the regulatory period (starting price) would have been adjusted, based on the current and projected profitability of each supplier;[10] and

   8.2 The annual rate of change in price allowed during the regulatory period would also have been adjusted, to exclude the impact of the recent change in Goods and Services Tax (GST).[11]

9. Consequently, a materially different path would have been set for each supplier and, to promote the Part 4 Purpose, we propose to reset the paths in accordance with the relevant statutory processes.[12] In doing so, we have applied the re-determined input methodologies for default price-quality paths.

Claw-back may be applied if a supplier's path is reset

10. As provided for under the s 54K(3) of the Act, we have also considered whether it would be appropriate to apply claw-back if a supplier's default price-quality path is reset. Applying claw-back would mean that either:[13]

    10.1 The supplier has to lower its prices on a temporary basis, to compensate consumers for some or all of any over-recovery that occurred under the prices previously charged; or

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9 The power to reset each supplier's default price-quality path may not be exercised later than nine months after input methodologies are published. Refer: ss 54K(3) and (4). As we discuss in Chapter Two, as a result of directions from the High Court in *Vector Ltd v Commerce Commission* HC Wellington CIV-2011-485-536 (26 September 2011) the 9 months in s 54K(4) will run from the date that input methodologies are re-determined.

10 The supplier's starting price is important because it anchors the price changes that are allowed until the end of the regulatory period.

11 The rate of change is expressed with reference to changes the Consumer Price Index (CPI) in the form 'CPI-X', where X is a percentage differential known as the X factor. Excluding the impact of the October 2010 change in GST from the CPI would reduce prices by approximately 2%.

12 As set out under s 53P of the Act.

13 Refer: s 52D(1) of the Act.

10.2 The supplier is able to recover some or all of any shortfall in its revenues that occurred under the prices previously charged.

11. Any claw-back must be spread over time to minimise undue financial hardship to the supplier, or price shocks to consumers.[14]

How we have revised our approach from the July 2011 draft decision

12. Our previous draft decision to reset each supplier's default price-quality path would have resulted in input methodologies being applied on 1 April 2012 ('July 2011 Draft Decision').[15] That draft decision was never finalised, however, because we were required by the High Court to re-determine input methodologies before the reset could be made.[16]

13. We have now revised our July 2011 Draft Decision:

13.1 By applying re-determined input methodologies for default price-quality paths; and

13.2 In response to material received since the July 2011 Draft Decision was published.

14. We have also revised our approach in the July 2011 Draft Decision to neutralise the impact of the delay to the process for applying input methodologies; namely through the proposed approach to claw-back.

Application of re-determined input methodologies

15. Applying re-determined input methodologies results in revised estimates of each supplier's costs when current and projected profitability is assessed. In July 2011, each supplier's costs were calculated in a way that was consistent with the input methodologies for information disclosure regulation. This time we have applied re-determined input methodologies that are specific to default price-quality paths.

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14 As required by s 52D(2) of the Act.

15 Commerce Commission, *2010-15 Default Price-Quality Path for Electricity Distribution – Draft Decisions Paper*, 19 July 2011.

16 *Vector Limited v Commerce Commission* HC Wellington CIV-2011-485-536 (26 September 2011).

Material received since the July 2011 draft decision

16. We have also revised our approach in response to material received after our July 2011 Draft Decision was published. The material considered includes specific information that we requested from suppliers, and submissions and cross-submissions on our:

    16.1 July 2011 Draft Decision; and

    16.2 December 2011 Process and Issues Paper.[17]

17. However, we have not considered any responses received outside of our consultation timeframes.[18] Material received outside of these timeframes will be published on our website, and will be considered alongside submissions and cross-submissions on this paper.

Neutralising the impact of the delay to apply input methodologies

18. Finally, and as noted above, we now propose to apply claw-back to neutralise the impact of the delay to the reset process. In particular, we propose to apply claw-back so that all suppliers would be able to earn a normal return from 1 April 2012. For most suppliers, the amount to be clawed back would be equal to any over- or under-recovery in 2012/13.

Scope of this revised draft decision

19. This revised draft decision sets out how and why we propose to reset the default price-quality paths that apply to 16 suppliers of electricity distribution services. Orion New Zealand (Orion) will be considered separately in light of the situation caused by the Canterbury earthquakes.[19]

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[17] This is because a number of the points raised in submissions on our December 2010 Process and Issues Paper related to a stand-alone starting price adjustment input methodology, which we are no longer required to determine. However, some of the points raised in those submissions were relevant to the approach we have proposed in this paper. Refer: Commerce Commission, *Additional Input Methodologies for Default Price-Quality Paths*, 09 December 2011.

[18] We will take into account any relevant information contained in that material as part of the consultation on this revised draft decision. Refer: Letter from Nathan Strong (Chair of the Electricity Networks Association), *Addressing forecast error – testing forecast validity in setting the SPA IM and DPP*, 29 April 2012; available at http://www.comcom.govt.nz/additional-input-methodologies-for-electricity-and-gas-dpps/. See also: Letter from Allan Carvell (Group General Manager Regulation and Pricing), *Re: Starting price adjustments for electricity distribution and gas pipeline services*, 5 July 2012; available at: http://www.comcom.govt.nz/2010-2015-default-price-quality-path/.

[19] We will continue to work with Orion to develop an appropriate regulatory response to the circumstances surrounding the Canterbury earthquakes. Orion has indicated that it intends to propose a customised price-quality path in the February 2013 window. However, if that does not happen, then we may reset

20. The changes that we have proposed to make to each supplier's path are based on the application of re-determined input methodologies. The re-determined input methodologies do not give rise to resetting each supplier's quality standards, or the industry-wide X factor.

Material that accompanies this paper

21. The following material will be released for interested parties to consider alongside this paper:

    21.1 The draft determination that sets out our revised draft decision;

    21.2 The Excel models that we relied on in reaching our revised draft decision;

    21.3 The Stata modelling and data files for our econometric analysis;

    21.4 An independent review undertaken by Nel Consulting Limited of supplier-proposed adjustments to initial regulatory asset values; and

    21.5 An independent review undertaken by Professor Jeff Borland, University of Melbourne, of the econometric analysis we have used for our revised draft decision.

22. We also intend to provide an overview of our Excel models to interested parties. A copy of the external review of our Excel models will be made available on request.

How you can provide your views

23. You are invited to provide your views on any aspect of this paper, or any other issue that you think should be before us in reaching our final decision.

24. The timeframes in which you must provide your views are set out in the table below. We do not expect to be able to take into account any material provided outside of the timeframes shown.

Orion's default price-quality path with updated information after the February window has closed, but within 9 months of the date that input methodologies are re-determined.

Dates for responses and process from here

Date	Event
30 September 2012	Re-determination of input methodologies
01 October 2012	Submissions due on this paper
12 October 2012	Cross-submissions due on this paper
19 November 2012	Technical consultation
30 November 2012	Final decision on the proposed reset of default price-quality paths

25. As shown in the table, we intend to reach a final decision on the proposed reset by 30 November 2012. Any revisions to the timeframes set out above would make it likely that the proposed changes would not be able to take effect from 1 April 2013. If so, we would expect that any changes would take effect as soon as possible after 1 April 2013.[20]

26. We will soon issue further information gathering requests to obtain information that would allow us to implement our revised draft decision. The additional information required now is limited. Examples of the types of information that we intend to request are provided in Attachment K.

[20] The compliance formula would be amended as appropriate to achieve an equivalent outcome to the extent practicable.

Address for responses

27. You should address your responses to:

    John G. McLaren (Chief Adviser, Regulation Branch)
    c/o regulation.branch@comcom.govt.nz

28. Responses should be provided in a file format suitable for word processing, rather than the PDF file format.

Requests for confidentiality

29. While we discourage requests for non-disclosure of submissions, we recognise that there may be cases where parties that make submissions wish to provide information in confidence. We offer the following guidance.[21]

    29.1 If it is necessary to include confidential material in a submission, the information should be clearly marked.

    29.2 Both confidential and public versions of the submission should be provided.

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

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

[21] Parties can also request that we make orders under s 100 of the Act in respect of information that should not be made public. Any request for a s 100 order must be made when the relevant information is supplied to us, and must identify the reasons why the relevant information should not be made public. We will provide further information on s 100 orders if requested by parties. A key benefit of such orders is to enable confidential information to be shared with specified parties on a restricted basis for the purpose of making submissions. Any s 100 order will apply for a limited time only as specified in the order. Once an order expires, we will follow our usual process in response to any request for information under the Official Information Act 1982.

2. Why we propose to reset the default price-quality paths

Purpose of this chapter

31. In this chapter we set out why we consider we can reset each supplier's default price-quality paths under s 54K(3) as a result of re-determining input methodologies. We also explain why we propose to exercise our discretion in s 54K(3) to reset each supplier's path in the middle of the regulatory period.

Application of re-determined input methodologies

32. As noted in the Introduction, applying the re-determined input methodologies at the time each supplier's path was set, ie, on 30 November 2009, would have led to materially different paths to those we determined for suppliers at that time.[22] This is because the re-determined input methodologies provide us with the key inputs to set starting prices based on the current and projected profitability each supplier.[23]

33. We propose to have the reset determined so it can inform regulated suppliers' pricing decisions prior to the start of the next pricing year, ie, 1 April 2013. This means there is necessarily some overlap in our consultation process on the input methodologies for default price-quality paths and our proposed reset.[24]

Transitional reset at the start of the new Part 4 price-quality regime

34. In order to transition suppliers from the previous threshold regime, starting prices for the default price-quality path for the first regulatory period, of 1 April 2009 to 31 March 2010, were required to be those prices the businesses were charging at the end of their old threshold path.[25]

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22 We note that some suppliers, such as Vector Limited, responded to our July 2011 Draft Decision stating that s 54K(3) only permits us to reset the current paths to the extent that a specific input methodology would have resulted in a materially different path. Refer: Vector Limited *Submission to the Commerce Commission on Draft Decision and Starting Price Adjustments for Electricity Distribution Businesses* 24 August 2011 at para 16. Since then, we have consulted on re-determining input methodologies for default price-quality paths in accordance with *Vector Ltd v Commerce Commission* HC Wellington CIV-2011-485-536 (26 September 2011). The re-determined input methodologies now provide us with the key parts of the package required to set starting prices based on s 53P(3)(b). The Court of Appeal has recently expressed the view that we are entitled to use the input methodologies we are re-determining for default price-quality paths to carry out a complete reset of the paths under s 54K(3) of the Act rather than limiting that reset to the impact on the path of each input methodology. (*Commerce Commission v Vector Limited* [2012] NZCA 220 at [62] to [73]. That decision is under appeal to the Supreme Court.

23 Section 53P(3)(b).

24 We foreshadowed this in *Additional Input Methodologies for Default Price-quality Path – Processes and Issues Paper* (Wellington, 9 December 2011) at [31].

25 The threshold regime was established under the now repealed Part 4A of the Commerce Act, and the threshold paths were transitioned across under s 54J(2). A threshold path was broadly similar to a default price-quality path in that it set a weighted average price path and the rate of change for the path was set in the form CPI-X%. However, the statutory requirements were very broadly expressed; the threshold

35. We were subsequently required to reset each supplier's default price-quality path for the next regulatory period starting on 1 April 2010.[26] This meant we needed to have the reset paths determined by 30 November 2009 to be in place by 1 April 2010.[27]

36. The paths had to be reset regardless of whether some, or no, input methodologies had been set for default price-quality paths.[28] However, the paths could then be reset mid-period once input methodologies were determined, if those input methodologies would have led to a materially different path if they had been available for the reset of the path required to start on 1 April 2010 (s 54K(3)).

37. The starting prices for the paths to be in place by 1 April 2010 could be set on the basis of either:

    37.1 A further roll-over of the prices from the preceding period, that is from the threshold regime;[29] or

    37.2 Our assessment of a supplier's current and projected profitability.[30]

38. To set starting prices on 30 November 2009, we decided to roll over prices that applied at the end of the preceding period. We decided to do this because, as noted at the time, we were still in the process of consulting on the methodologies required to calculate the key inputs to a starting price adjustment based on each supplier's current and projected profitability.[31]

39. We consulted on this approach and received near unanimous support for delaying adjusting prices until input methodologies were determined.[32]

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could be expressed in quantitative or qualitative terms (refer to the now repealed s 57G). There was no starting price adjustment. There was also no concept of defined input methodologies to be applied to regulatory controls; we were under no requirement to determine a set approach to asset valuation or cost of capital to be applied to a threshold path.

[26] Section 54K(1).

[27] Section 53M(7).

[28] Section 54K(2).

[29] Section 53P(3)(a).

[30] Section 53P(3)(b).

[31] Commerce Commission *Decisions Paper: Initial Reset of the Default Price-quality Path for Electricity Distribution Businesses* (Wellington, 30 November 2009) at [4.47] to [4.48] and [4.51] to [4.55].

[32] We only received one submission, from MEUG, that did not support this approach. Refer: Commerce Commission, *Decisions Paper: Initial Reset of the Default Price-Quality Path for Electricity Distribution Businesses*, 30 November 2009, at [4.52].

Determination of input methodologies

40. We subsequently determined input methodologies to apply to the regulation of electricity distribution businesses on 22 December 2010.[33]

41. Having determined the input methodologies, we then sought to carry out a mid-period reset of the current default price-quality paths so the reset paths would be in place for the pricing year to start on 1 April 2012.

42. We issued a draft reset decision with indicative price adjustments last July. However, the High Court then held that before completing any reset we had to specify the input methodologies for cost allocation, asset valuation, and the treatment of tax as applicable to default price-quality paths.[34] We were not permitted to simply use the equivalent input methodologies set, and the data received, under information disclosure.

43. The High Court also held that we were to determine a stand-alone starting price adjustment input methodology for resetting prices under s 53P(3)(b). Despite appealing that finding, we started the process of determining that input methodology so as to ensure a reset could be in place for the pricing year to start on 1 April 2013.[35] We also signalled that we may use claw-back to neutralise the impact of the delay to the reset process.[36]

44. The Court of Appeal subsequently upheld our appeal and we are no longer required to determine a starting price adjustment input methodology.[37]

45. We recently released for consultation draft input methodologies for asset valuation, treatment of tax and common cost allocation for default price-quality paths.[38] The

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33 The statutory deadline was extended pursuant to s 52U(2) to 30 December 2010. (MO No 183/09 (10 December 2009) *New Zealand Gazette* at 4426.

34 *Vector Limited v Commerce Commission* HC Wellington CIV-2011-485-536, 26 September 2011. Pursuant to directions of the High Court, the 9 month period for resetting the default price-quality path under s 54K(3) will run from the point the input methodologies are determined.

35 The High Court issued directions to extend the statutory period for determining these input methodologies under s 52U to 30 September 2012 to allow for this redetermination. The time period for any reset of a default price-quality path under s 54K(3) or s 55F(4) was thereby extended to 9 months from the redetermination of these input methodologies.

36 Refer to letter sent to suppliers that are subject to default price-quality paths, dated 15 December 2011t: www.comcom.govt.nz/2010-2015-default-price-quality-path/

37 *Commerce Commission v Vector Limited* [2012] NZCA 220. This decision is under appeal to the Supreme Court. We also note that as the statutory deadline for determining any input methodologies for electricity distribution businesses has now passed (s 52U), we cannot now determine any further input methodologies save at the direction of a court.

consultation documents include a proposed amendment to the cost of capital input methodology for the term credit spread differential. As the proposed amendment provides consistency with the other input methodologies, we intend to apply the amendment in any mid-period reset. We invite submissions on this approach.

46. We are due to re-determine the input methodologies for default price-quality paths by 30 September 2012. While we are still in the process of considering submissions on our proposed input methodologies, on the basis of the submissions we have received we do not consider any of the changes proposed will significantly alter those input methodologies. We have therefore used them to consider if a reset can be made under s 54K(3).[39]

Why a materially different path would have been set

47. The key changes that occur when input methodologies are applied to each supplier's paths are an adjustment to:

    47.1 The starting price based on the current and projected profitability of each supplier; and

    47.2 The annual rate of change, due to the definition of the CPI in the specification of price input methodology which excludes the impact of changes in Goods and Services Tax ('GST').

48. We would expect that setting the default price-quality paths on the basis of an assessment of each supplier's current and projected profitability, as opposed to simply rolling over prices from the previous threshold regime, would lead to materially different paths for most, if not all, suppliers.[40]

49. To explain, the re-determined input methodologies provide us with the detailed building blocks to assess an adjustment to starting prices on the basis of a supplier's current and projected profitability to allow a normal return over the regulatory

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38 Commerce Commission, *Draft Input Methodologies for Default Price- Quality Paths – Allocation of Costs, Valuation of Assets and Treatment of Tax; Amendment to the Cost of Capital Input Methodology – Consultation Paper* (15 June 2012).

39 It does mean however, that figures for our proposed reset are only indicative.

40 We also refer to Unison Networks Limited's cross submission on this issue in relation to the reset proposed last year (Unison Networks Limited *Cross-submission on Submissions on 2010-2015 Default Price-quality Path for Electricity Distribution, Draft Decisions Paper* (5 September 2011)). As Unison discusses, unless we were to adopt extreme approaches to starting price adjustments which would be unlikely to meet the Part 4 purpose, the materiality of the changes resulting from the input methodologies and dispersion in return on investment is such that there would be a material difference.

period.[41] This is because the input methodologies for the cost of capital, asset valuation, cost allocation and the treatment of tax enable us to assess the reasonable costs of a supplier to consider an appropriate return on investment over the regulatory period.[42]

50. In order to consider a reset, we have obtained supplier specific information to allow us to apply the re-determined input methodologies. We have then applied the data collected to make an assessment of the current and projected profitability of each supplier.[43]

51. As shown at paragraph 69 of Chapter 4, the results of our analysis indicate that materially different paths would be set when we apply the re-determined input methodologies. There would have been a sufficiently large price adjustment for all suppliers to conclude that there was a material difference between the paths reset by applying the input methodologies and those set through a roll-over of previous prices.

52. To provide some context for this conclusion, as we indicated in 2010 when determining a materiality threshold for the cost allocation input methodology, a 1-2% change in revenue for regulated revenues services equates to a 3-6% change in earnings before tax.[44] We therefore considered that even a 1% change in revenue represented a material change from both a supplier and consumers point of view.[45]

53. As our modelled results indicate all default price-quality paths will change by at least 1% by applying the re-determined input methodologies, we consider a materially

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41 We explain what we mean by a 'normal return' under Part 4 in our paper *Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses*) *Reasons Paper* (Wellington, 22 December 2010) at [2.8.6].

42 *Input Methodologies (Electricity Distribution Businesses and Gas Pipeline Businesses*) *Reasons Paper* (Wellington, 22 December 2010) at [2.8.32]

43 Ordinarily we would use the data collected from information disclosure regulation to apply to a reset of default price-quality path. However, due to the timing of the implementation of default price-quality paths, we have had to use s 53ZD notices to obtain the equivalent information.

44 Commerce Commission, *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper* (Wellington, December 2010) at B3.1 to B3.16.

45 A 1% change in revenue is also the threshold for a 'change event' allowing the reconsideration of a customised price-quality path. We also observe that the National Electricity Legislation in Australia for merits appeal to the Australian Competition Tribunal includes a financial threshold for allowing an appeal of 2% of average annual regulated revenue of the regulated network of a supplier.[45] (Refer National Electricity (South Australia) Act 1996, s 71F(2).)

different path would have been set if those input methodologies had been applied when we set the current paths.[46]

Resetting the default price-quality path would promote the Part 4 Purpose

54. Section 54K(3) provides us with discretion as to whether or not to reset paths if a materially different path would have been set using input methodologies determined after 1 April 2010.

55. We consider we should use our discretion to carry out a mid-period reset as this will better promote the Part 4 Purpose. The key reason is that the reset path will apply the re-determined input methodologies which have been specifically developed to promote the outcomes in the Part 4 Purpose. By contrast, the current path has been set without any reference to input methodologies determined under Part 4. The current paths are therefore unlikely to promote the outcomes of the Part 4 Purpose to the same extent.[47]

56. The re-determined input methodologies enable us to reset starting prices to allow most suppliers to earn a normal return. Our modelling suggests that some suppliers are earning above normal returns. Under a reset path that applies input methodologies, those suppliers will need to improve efficiency to maintain their current level of profitability and/or limit their excessive profits. (It may be that these suppliers have failed to share previous efficiency gains with consumers.)[48] Our analysis also indicates some suppliers are currently earning less than normal returns.

57. Overall, we are satisfied that the proposed reset would better promote the Part 4 Purpose. We therefore consider we should exercise our discretion to reset suppliers' paths as this will be in the long-term interests of consumers.

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[46] Our modelling indicates the smallest change is to Eastland Network a 1.6% adjustment. We consider the change resulting from the starting price adjustment is sufficient to indicate a materially different path would have been set using the re-determined input methodologies. In any event, the application of the specification of price input methodology will also result in a materially different path in terms of the rate of change.

[47] We note that to some extent any default price-quality path set under Part 4 will promote some aspects of the Part 4 Purpose. However, the reset path benefits from the direct application of input methodologies determined by reference to the Part 4 Purpose and will better promote that purpose.

[48] Section 52A(1)(b) to (d).

3. Overview of the proposed reset

Purpose of this chapter

58. This chapter provides an overview of the key impacts of the proposed reset on each supplier.

Key impacts of the proposed reset on each supplier

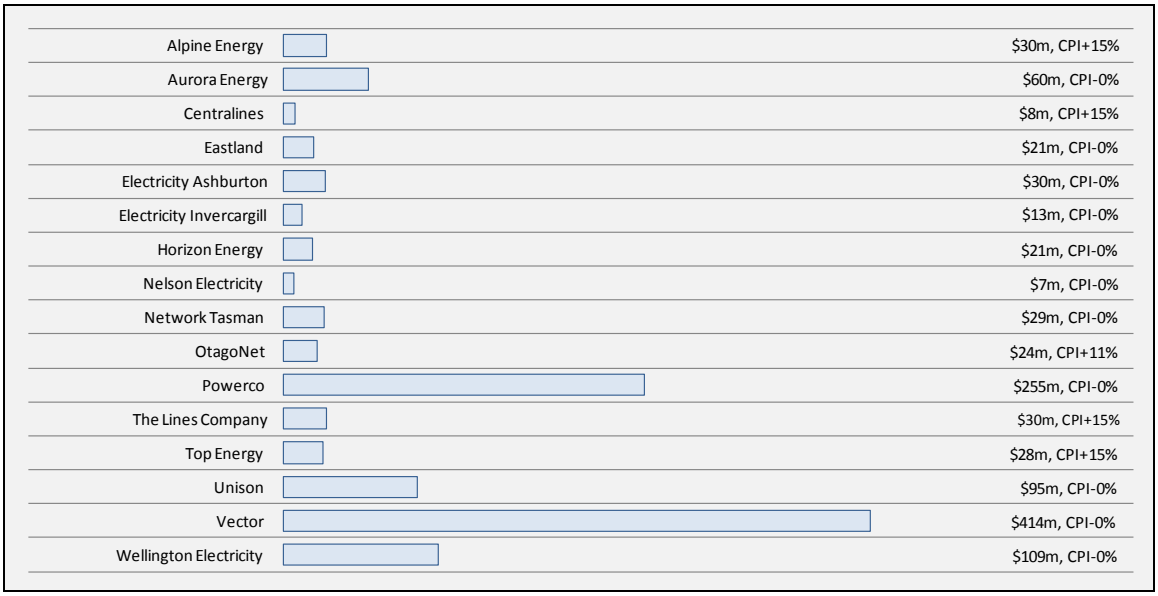
59. Applying the re-determined input methodologies results in a number of changes to the default price-quality path determination, which are explained in Attachment M.

60. All of the proposed changes would take effect from 1 April 2013. They will also affect the earlier years of the path set out in the determination, ie, from 1 April 2010, but those changes will have no practical effect on our compliance assessments.

Revenue expected in 2013/14 and allowable rates of change in prices

61. Chart 1 below shows the amount of revenue that we expect that each supplier would recover through distribution prices in 2013/14, if our revised draft decision was implemented, and on the rate of change in price that would be allowed on 1 April 2014.[49]

Chart 1: Expected revenue 2013/14 and allowable rate of change in price in 2014



[49] We refer to the revenue figures in the determination as 'maximum allowable revenue', or 'MAR'. Importantly, if our draft decision was implemented, actual revenue in 2013/14 may differ from the amounts shown. For example, suppliers may be able to grow their quantities faster than our assumptions. Orion is not shown on the chart below because we do not propose to reset Orion's default price-quality path at this time.

62. Chart 1 also shows that effect of spreading price increases over two years for five suppliers. For all other suppliers, the maximum permitted year-on-year distribution price change on 1 April 2014 is CPI-0%, prior to the recovery of any claw-back amounts.[50]

63. As discussed further in Chapter Six, to minimise price shocks to consumers, we propose to cap the largest year-on-year distribution price increases at CPI+15%. The cap is proposed because of the practical limitations in spreading price increases with only two years of the regulatory period remaining.[51] Without the cap, the proposed year-on-year distribution price increases would have been as high as CPI+27%.

Claw-back to earn a normal return from 1 April 2012

64. Irrespective of the proposed cap, the proposed application of claw-back would ensure that suppliers recover the revenue that our modelling indicates is required to earn a normal return from 1 April 2012. These amounts can be spread beyond the end of the current regulatory period.

65. Provided we apply claw-back in this way, no suppliers will be disadvantaged in present value terms if a cap is applied to the price increases permitted in this regulatory period. This is because, where a cap is applied, a higher amount would be clawed back than would otherwise be the case.

66. Chapter Seven explains our reasons for applying claw-back, and how we propose to spread claw-back over time.

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50 This constraint is based on the long-run average productivity improvement rate achieved by suppliers in New Zealand, as required under s 53P(6) of the Act.

51 In developing this proposal we have been mindful of the possible impact of increases on consumers' total electricity bills.

4. Analysis of price adjustments and supplier profitability

Purpose of this chapter

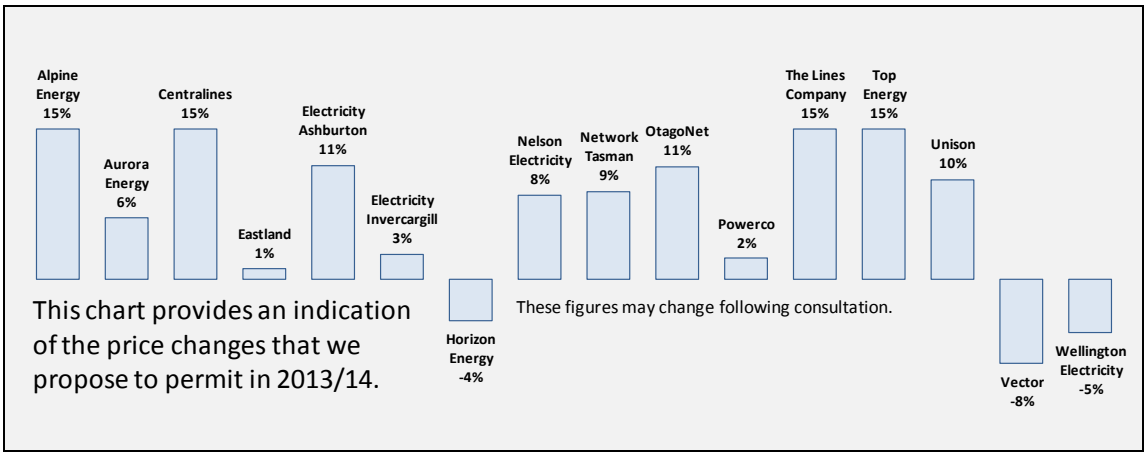
67. This chapter provides an indication of the proposed adjustments to each supplier's price, and explains the relationship with each supplier's profitability.[52]

Significant rebalancing of prices across distributors—Less pronounced impact overall

68. Our revised draft decision proposes a significant rebalancing of prices across electricity distributors, but there would be a less pronounced impact overall. The weighted industry average price increase in 2013/14 would be approximately 1%. In practice, however, the overall adjustment will be lower in 2013/14, as we have spread some price increases over more than one year.

69. Chart 2 below provides an indication of the average adjustment to the distribution line charge component of consumer bills for each supplier.[53] These values have been calculated by comparing our forecasts of each supplier's revenue in 2013/14 before and after the proposed adjustment to their price cap. It is therefore not the year-on-year change, which would include a CPI adjustment.

Chart 2: Rebalancing of distribution prices on 1 April 2013



70. Price rebalancing is not unusual when the interval between periodic price adjustments is equal to a regulatory period of five years or more. Between adjustments, it is appropriate that profits increase if a supplier achieves efficiency

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52 Under s 53P(3)(b) of the Act, an adjustment to a supplier's starting price must be based on the current and projected profitability of each supplier.

53 Guidance on how to interpret these figures is provided in paragraphs 84 to 87 of this chapter. Notably, the figures may change following consultation, and do not reflect the likely impact on retail prices (which include transmission charges and the cost of generated energy). Nor do the figures reflect the likely impact on individual consumers, or groups of consumers, because suppliers are able to vary their pricing structure. We also note that our estimates are based on suppliers pricing in line with the price cap, which they may not be doing.

gains. Equally, profits will fall if costs are not controlled. However, neither effect would be expected to persist over the long-term in a competitive market.

Price rebalancing is part of the transition to a new regulatory regime

71. Price changes would be particularly likely in the case of the proposed reset because, if implemented, it would be the first starting price adjustment since wide ranging reforms to the regulatory regime began with the introduction of the now-revoked Part 4A in 2001. We would expect a greater extent of price rebalancing at this first starting price adjustment (implemented under Part 4) than we would in future.

72. The starting price for each supplier's default price-quality path was set using the prices that applied at the end of the previous regulatory period, which were similarly 'rolled over' from the price path thresholds that have applied since 2003. These in turn were based on prices in 2001.

73. The consequences of failing to comply with a default price-quality path are potentially more severe than a breach of a price path threshold would have been, and more precise modelling of supplier profitability is appropriate. However, suppliers are not required to price up to the price cap we set. Equally, a customised price-quality path is an option for suppliers that think that their price cap is too low.

74. By contrast, the price path we set under the previous thresholds regime was a screening mechanism to identify suppliers whose performance may warrant further examination. Further examination, if required, would not necessarily have led to a price cap being introduced, let alone penalty provisions being imposed.

Adjustments are based on the current and projected profitability of each supplier

75. Unlike the prices that were rolled over from the thresholds regime, the price changes that we propose in this paper are based on the current and projected profitability of each supplier. The thresholds relied on information that is now many years out of date. However, the price changes that we propose now reflect more recent information, and a more detailed assessment of each supplier's costs.

Impact of applying re-determined input methodologies

76. To adjust prices based on the current and projected profitability of each supplier, we have calculated each supplier's costs on a 'building block' basis, and then set prices that factor in the outlook for future demand. The key building block cost components are the return *on* and *of* capital, operating expenditure (opex), and tax.

77. We calculated these costs by applying re-determined input methodologies—which among other things—differ in two key respects to the way we calculated costs when we assessed profitability under the previous Part 4A information disclosure regime. Following almost two years of consultation on input methodologies:

77.1 Higher up-front cash flows are implied by the input methodologies for the treatment of taxation, relative to the tax payable approach used for information disclosure under the previous Part 4A regulatory regime. Providing greater up-front cash flows is consistent with providing incentives for new investments, because doing so brings forward the rate at which suppliers can recover those investments.[54]

77.2 The input methodologies for asset valuation have resulted in increases to asset values for certain suppliers compared to the values that applied at the end of the previous Part 4A regulatory regime. The allowed increases address the concerns suppliers have raised about the previous asset values, thereby reinforcing the credibility of the valuations used to set prices and assess returns under the Part 4 regime.[55]

78. Nevertheless, price decreases still appear appropriate for some suppliers, despite the higher up-front cash flows implied by input methodologies. The proposed price reset would limit these suppliers in their ability to earn excessive profits. However, we would still expect that the proposed prices would be consistent with those suppliers being able to earn a normal return on their investments.

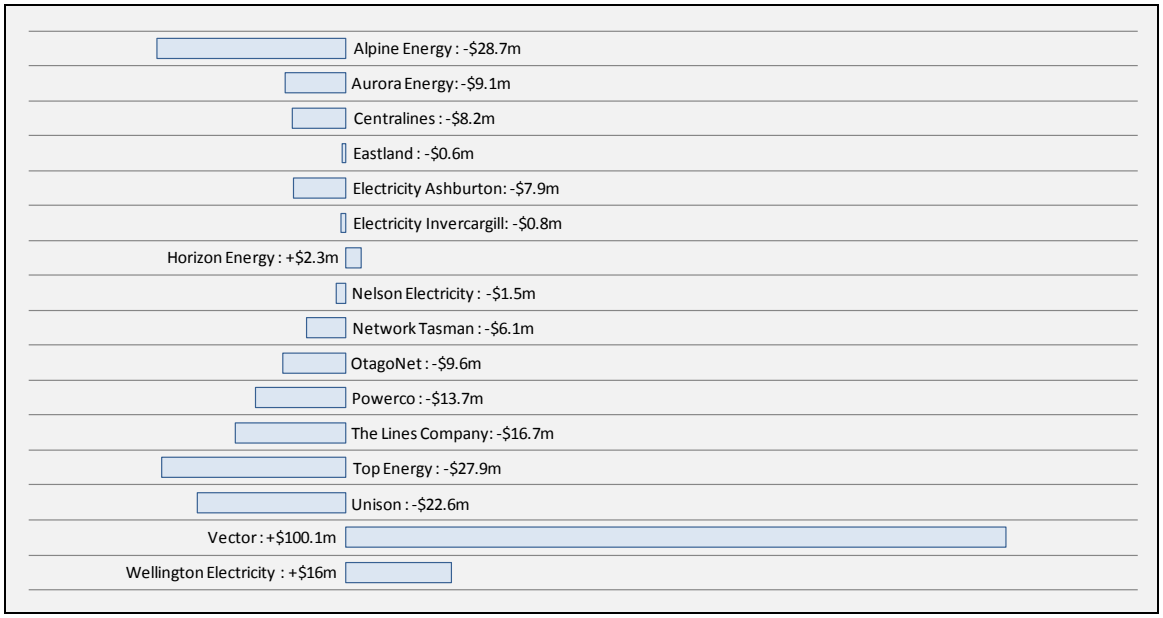
Realigning forecast costs and revenues

79. The estimates shown in Chart 3 overleaf highlight the difference between forecast costs and revenue for each supplier between 1 April 2012 and 31 March 2015. The figures shown are present values as at 1 April 2012.

[54] Commerce Commission, *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons paper*, 23 December 2010, paragraph 4.3.9.

[55] Commerce Commission, *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons paper*, 23 December 2010, paragraph 4.3.40.

Chart 3: Forecast revenues minus forecast costs
1 April 2012 to 31 March 2015



80. Because this reset would occur midway through the current regulatory period, it is important that the forecasts we rely on do not inadvertently:

80.1 Penalise suppliers that have achieved efficiency gains since the start of the regulatory period in response to the incentives inherent in the price path; or

80.2 Disadvantage consumers of suppliers that have not been able to control expenditure in response to the incentives inherent in the price path.

81. Consequently, we have attempted to reduce our reliance on information about a supplier's actual costs since the start of the regulatory period. We have, however, taken into account more recent information where it would be unlikely to undermine any action taken by suppliers or consumers since the start of the regulatory period.

82. Factors that are largely outside the control of either suppliers or consumers include:

82.1 Movements in input prices;

82.2 Actual and expected changes in population; and

82.3 Changes in the outlook for regional output, ie, Gross Domestic Product (GDP).

83. However, for forecast changes in the CPI, the forecast that we propose to use is the forecast that was most recently available when the cost of capital was determined in September 2009. Such an approach ensures that the implied real return during the

regulatory period is consistent with the inflation expectations that are embedded in our estimate of the cost of capital.[56]

Guidance to help interpret our results

84. The next section explains how we propose to reset prices for each supplier; but first, we provide some guidance about how to interpret the results shown earlier in this chapter. The figures shown simply give an indication of the likely impact that implementing our revised draft decision would have on the average price charged by each regulated electricity distributor, net of other price components.

85. These figures must therefore be interpreted with caution, not least because all figures in this chapter are indicative only, and may change following consultation. In particular, we are yet to consider responses to this paper, and the re-determined input methodologies have not yet been finalised.

86. In addition, the indicative adjustments do not reflect:

    86.1 The likely impact on the average price of electricity lines services. Claw-back and transmission charges would also have an effect.

    86.2 The actual impact on average retail prices.[57] All else being equal, the average percentage change in consumer bills would be approximately one third of the amount shown, before claw-back or changes in transmission charges are taken into account. Changes in the other components of electricity bills are also important, eg, the cost of generated energy and transmission charges.

    86.3 The likely impact on any particular consumer, or group of consumers. The impact on different consumer groups will depend on whether electricity

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[56] We received one submission in response to the Draft Input Methodologies for Default Price-Quality Paths that argued against this approach. In particular, PwC (on behalf of Powerco) have argued that we should use actual CPI figures for years in which they are known. We do not agree because this treatment would imply a different real return for suppliers, when prices are set, than is implied by nominal cost of capital. For example, had inflation been significantly higher than forecast in the opening years of the regulatory period, then the implied real return would be very low. This treatment would therefore appear at odds with the reason for applying indexation in the first place which, as PwC notes on page 3 of its submission, was to protect suppliers against inflation risk. With that concern in mind, the existing price path has been updated for inflation during the regulatory period, and will continue to be updated for actual inflation if it is reset. However, the approach we propose to use to reset the path is based on inflation expectations pertaining at the time the cost of capital was estimated. We intend to respond to the other issues PwC raises in its submission in our final reasons paper for the input methodologies re-determination. Refer: PwC submission (on behalf of Powerco), Draft Input Methodology for Default Price-Quality Paths – Inflation Issues, 6 July 2012.

[57] The Electricity Commission estimated that in 2006 network charges (which include transmission and distribution charges) made up approximately 40% of residential customer bills (Electricity Commission, *Market Design Review – Options Paper*, 8 July 2008, paragraph 56).

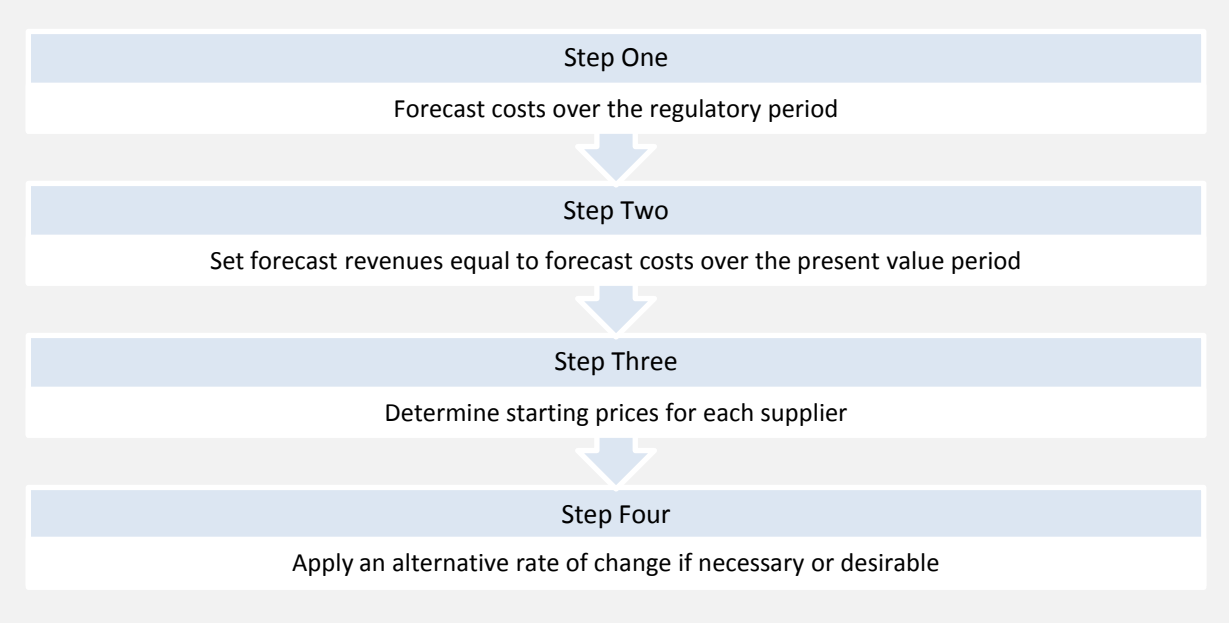
distributors choose to rebalance their pricing structure when price changes are notified, eg, price changes may be different for residential, industrial, and commercial users.[58]

87. The exact magnitude of any adjustment would depend on the prices that electricity distributors choose to set, relative to their existing prices, given the constraint imposed by the price path compliance formula. For example, the price path sets a cap, and some suppliers, eg, those with some degree of consumer-ownership, may choose to set prices that are below the cap.

Summary of the approach that we propose to use to adjust prices

88. The approach that we propose to use to adjust prices for each supplier has 4 main steps. These steps are shown in Figure 1.

Figure 1: Overview of the approach we propose to use to adjust prices



89. Each of the steps in the approach is explained in the sections that follow. We begin by setting out how the re-determined input methodologies applied to our decision making for the proposed price reset, ie, by directing us to calculate each supplier's costs in a particular way.

[58] The new prices charged to individual consumers will be determined by the pricing methodologies that each supplier applies when it determines prices and retail pricing (where the supplier does not bill end-use consumers of electricity directly).

Step One—How we forecast each supplier's costs over the regulatory period

90. Consistent with the re-determined input methodologies, we have proposed a 'building block' based approach to forecast each supplier's costs. The main building block cost categories are:[59]

    90.1 The return *on* capital, net of any revaluations of the Regulatory Asset Base (RAB);[60]

    90.2 The return *of* capital, to allow recovery of depreciation;

    90.3 Operating expenditure (excluding pass through costs and recoverable costs); and

    90.4 Tax costs.

91. To calculate each of these cost categories, we applied the re-determined input methodologies, which set out how:[61]

    91.1 Forecast and existing investments are valued;

    91.2 Depreciation and revaluations are calculated;

    91.3 Tax costs are calculated;

    91.4 Costs are allocated; and

    91.5 The cost of capital is estimated.

92. We apply the re-determined input methodologies to forecasts of each supplier's capital expenditure (capex) and opex. This is because regulatory assessments of building block costs are informed by, but not the same as, assessments of each supplier's expenditure streams.[62]

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[59] An overview of the building block approach can be found in 2.8.5 to 2.8.20 of Commerce Commission, *Input Methodologies (Electricity Distribution and Gas Pipeline Services), Reasons Paper*, 22 December 2010.

[60] Where necessary, the return *on* capital includes a term credit spread differential allowance to recognise additional costs that can be incurred by suppliers with longer term debt.

[61] Prior to input methodologies being introduced, these matters were amongst the most contentious aspects of regulatory decision making. For example, in the gas sector, we consulted for a number of years on the appropriate asset valuation methodology to be applied to our decision making for the Gas Authorisation. We consulted for a further two years on the same topic before input methodologies for asset valuation were determined in December 2010.

[62] Rather than recognising all expenditure in the year in which it is incurred, we smooth expenditure over time. This 'inter-temporal' allocation of expenditure recognises that assets are used to supply services

93. To forecast each supplier's capex, opex, and other line items, we have relied on a combination of low cost techniques, eg, reliance on the supplier's own forecasts, independent forecasts, and simplifying assumptions. This is because we are required to adopt relatively low cost approaches when resetting default price-quality paths.

94. More detail on the approaches that we propose to use to forecast each supplier's capex, opex, and other line items can be found in:[63]

    94.1 Attachment B: How we forecast capital expenditure;

    94.2 Attachment C: How we forecast operating expenditure; and

    94.3 Attachment E: How we forecast other line items.

Step Two—How we set forecast revenue equal to forecast costs

95. Figure 2 below provides an overview of the model that we used to set forecast revenue equal to forecast costs over the 'present value period'. The present value period for the proposed reset begins on 1 April 2012, ie, the date from which input methodologies would have been applied if our July 2011 Draft Decision had been implemented.

96. As will be apparent from Figure 2, while an adjustment to a supplier's starting price as at 1 April 2010 is the technical mechanism by which we reset their path, the starting price adjustment is actually 'back-cast' from an analysis of the returns required in the final three years of the period. This analysis provides the basis for determining the change required to the supplier's existing level of pricing.

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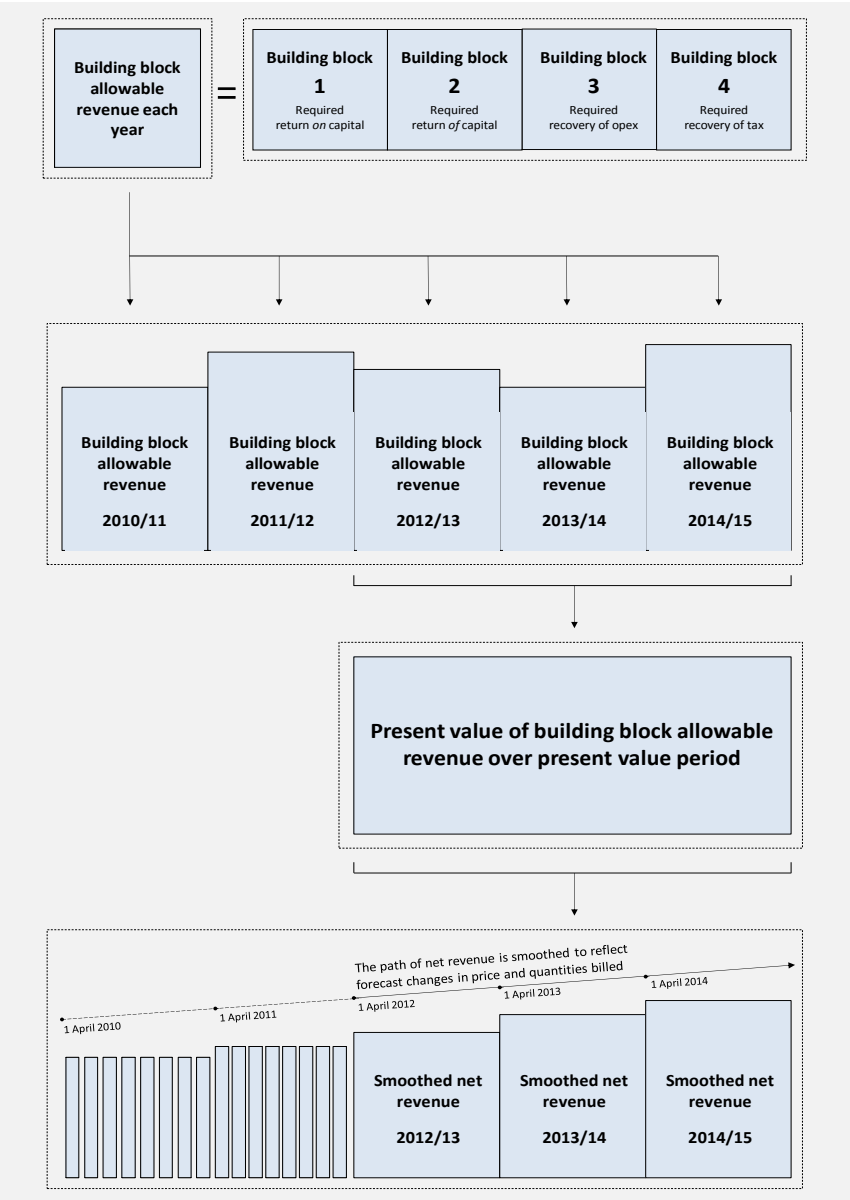
over multiple time periods. Similarly, expenditure must be allocated between services because not all expenditure relates to a single type of regulated service.

[63] We are required by the re-determined input methodologies to select a disclosure year as the base for our analysis. As noted in paragraphs 80 to 81 above, we propose to rely on information that pre-dates the start of the regulatory period. The most recent disclosure year prior to the start of the current regulatory period is 2009/10.

Figure 2: Setting forecast revenues equal to forecast costs



97. Once we have calculated each supplier's building block costs in a particular year of the regulatory period, we add the various components together to determine 'building blocks allowable revenue'. Building blocks allowable revenue is the amount of revenue that the supplier should be allowed to recover to offset their costs.[64]

98. Figure 2 also shows that we calculate building blocks allowable revenue in each and every year of the regulatory period. These amounts will vary depending on a number of factors, such as the age profile of the asset base, annual movements in opex, and changes in our assessment of tax costs.

64 In assessing building blocks allowable revenue, we take into account the likely timing of each cost item. The timing assumptions that we propose to rely on are explained in Attachment I.

99. Next, we calculate the present value of building blocks allowable revenue over the present value period. This is the amount of revenue that we expect the supplier would require to be able to earn a normal return from 1 April 2012. The discount rate used in the present value calculation is the industry-wide cost of capital.

100. Finally, we determine the path of revenue that would mean the supplier is able to recover the present value of building blocks allowable revenue over the present value period. This 'smoothed' path:

100.1 Starts on 1 April 2010;

100.2 Determines the amount of revenue that the supplier should expect to recover through distribution prices in 2013/14; and

100.3 Provides a baseline against which claw-back can be assessed.

101. The slope of the 'smoothed' path of revenue reflects the factors that affect each supplier's revenue during the regulatory period. In particular, a supplier's revenue depends on:

101.1 The price changes that a supplier is able to make, which will generally be constrained by the industry-wide rate of change in price, ie, CPI-0%; and

101.2 Changes in the quantities billed, which result in 'constant price revenue growth'.

102. Because we are interested in setting forecast costs and revenues equal from 1 April 2012, the most relevant changes in revenue are those that are likely to occur from that date. As noted above, we forecast price changes by relying on forecast changes in the CPI that are consistent with our estimate of the cost of capital. Constant price revenue growth is assessed using the approach in Attachment F.

Step Three—How we determined starting prices

103. The starting price for this path is calculated using a formula, but we are unable to perform the calculation ourselves. This is because suppliers have more information than us about changes in the quantities billed since 1 April 2010.

104. The formula sets out how the supplier can determine the starting price, ie, as at 1 April 2010, that would result in the supplier expecting to earn the appropriate amount of revenue in 2013/14. This formula can be found in Attachment F.

Step Four—How we applied an alternative rate of change if necessary or desirable

105. The way we propose to apply alternative rates of change depends on the intended impact of applying the alternative rate of change. In particular, whether or not the alternative rate of change is intended to result in an NPV-equivalent path, from

1 April 2013, when compared to the original path. The two scenarios are outlined further in Chapter Six.

105.1 In the most straightforward case, a cap of CPI+15% would be applied in both of the remaining years of the regulatory period, ie, the new X factor would be -15%.

105.2 In other cases, the amount of revenue to be allowed in 2013/14 would be re-calculated with different assumptions about the price changes that the supplier will be allowed to make, ie, to reflect the alternative rate of change.

106. On a purely technical level, and to simplify the formula that suppliers use to calculate their starting price when an alternative rate of change applies, we have proposed that the starting price, ie, as at 1 April 2010, will not be affected if an alternative rate of change is applied.[65] This approach is appropriate because, in the context of a mid-period reset, altering the 2010 starting price if alternative rates of change apply would have no impact on the following regulated outcomes:[66]

106.1 The prices previously charged by the supplier;

106.2 The amount that we propose to clawed-back; and

106.3 The prices that the supplier would be able to charge in future.

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65 Where relevant, we consider that s 53P(8)(a) allows us to either set an alternative rate of change to a starting price set on the basis of s 53P(3)(b), or to use a combination of an alternative rate of change and an adjustment to a starting price that would otherwise be set on a s 53P(3)(b) basis. However, as noted above, we do not intend to set out how the starting price should be re-adjusted because we do not intend to assess suppliers against the pre-reset years of the path for compliance purposes.

66 Unlike the usual situation, in which alternative rates of change are set to minimise price shocks or financial hardship from the start of the period onwards, the price changes that we are proposing will only affect prices from the middle of the period onwards.

5. The role of customised price-quality path

Purpose of this chapter

107. This chapter explains why our proposed approach will be appropriate for the majority of suppliers and why, for individual suppliers, the ability to propose an alternative price-quality path is important.

Our approach will be appropriate for the majority of suppliers

108. Periodic price adjustments are a key part of the intended operation of 'default/customised price-quality regulation'. The purpose of this type of regulation is shown in the box below.[67]

Box 1: Purpose of default/customised price-quality regulation

The purpose of default/customised price-quality regulation is to provide a relatively low cost way of setting price-quality paths for suppliers of regulated goods and services, while allowing the opportunity for individual suppliers to have alternative price-quality paths that better meet their particular circumstances

109. To meet the purpose of this type of regulation, any approach we use to reset prices must be relatively low cost. The biggest contributor to the costs of setting price-quality paths are audit, verification, and approval processes. Alternative techniques have therefore been proposed instead.

Almost all suppliers will expect to earn a normal return if prices are adjusted

110. Although our proposed approach is relatively low cost, we are confident that the almost all suppliers will expect to earn a normal return if the default price-quality path is reset. This is because:

    110.1 Our modelling relies on the supplier's own forecast of capital expenditure; and

    110.2 Our modelling of operating expenditure and revenue relies on independent forecasts that are free of systematic bias, in either direction.

111. In addition, the rate of return that we allow is above the central estimate of the cost of capital for the industry.[68]

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[67] This purpose of default/customised price-quality regulation is set out at s 53K of the Act.

[68] The difference between the 75th percentile estimate of the cost of capital and 50th percentile is equivalent to about 0.7 percentage points of annual returns.

A small number of suppliers may not expect to earn a normal return if the paths are reset

112. Nevertheless, because we rely on some information that is different to the supplier's own forecasts, a small number of suppliers may expect to earn less than a normal return under the default price-quality path. However:[69]

112.1 It would be costly to take into account all supplier-specific information when default price-quality paths are reset, because full audit, verification and approval processes would be required.

112.2 Customised price-quality paths provide an alternative option for suppliers that seek to have all of their information taken into account after testing through audit, verification and evaluation processes.

113. As shown in Figure 3 below, the process for proposing customised price-quality paths is a fundamental feature of default/customised price-quality regulation. It ensures that suppliers can have alternative price-quality paths that better meet their particular circumstances relative to the default price-quality path.

Figure 3: Overview of default/customised price-quality regulation

[69] Submissions received in response to our December 2011 Process and Issues Paper generally agreed that a simplified approach is required when setting the default price-quality path. However, we do not agree that a simplified approach implies that we should rely entirely on supplier's own information because, without full, audit, verification and evaluation processes, suppliers would have an incentive to inflate their forecasts to secure a higher starting price. Such an outcome would be less likely to be consistent with the Part 4 Purpose.

The costs and risks of customised proposals have been overstated

114. In response to our July 2011 Draft Decision, regulated suppliers argued that customised price-quality paths would be a 'high risk' and 'costly' error correction mechanism if starting prices were set too low. In their view, suppliers should be able to earn an appropriate return without having to either:

    114.1 Reduce investment under the default price-quality path; or

    114.2 Propose a customised price-quality path.[70]

115. These submitters have therefore argued that we should include an 'additional allowance' to guard against the risk that our forecasts were likely to contain error, ie, that suppliers may expect to earn less than a normal return under the default price-quality path.[71]

Why customised price-quality paths are not a 'high risk' option for suppliers

116. Having considered these submissions over a number of rounds of consultation, we have not been convinced that an additional allowance for this mid-period reset would better promote the Part 4 Purpose. As noted above, our proposed approach will allow almost all suppliers to earn a normal return under the default price-quality path.

117. In addition, in our view, regulated suppliers have over-stated the risks associated with a customised price-quality path proposal.[72] All the rules, requirements and processes for a proposal have been determined up-front, following more than two years of consultation. In addition, each supplier also has a form of 'merit' appeal to the High Court for:

    117.1 The input methodologies determination applying to price-quality paths under s 52Z ; and

    117.2 A customised price-quality path determination.

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70 Refer, for example: Vector, *Submission to Commerce Commission on Draft Decision on Starting Price Adjustments for Electricity Distribution Businesses*, 24 August 2011, pages 9 to 13.

71 The relevant forecast error here is the difference between our forecasts and the forecasts that we would rely on if we could apply audit, verification and evaluation processes to the supplier's own information. Unlike the estimation error associated with determining the industry-wide cost of capital, such errors can be reduced by considering supplier-specific information in detail. By contrast, the more general risk of forecasting error is a risk that suppliers are routinely exposed to in workably competitive markets, eg, the risk of error when forecasting input prices.

72 Refer, for example, Vector, *Submission on July 2011 Draft Decision*, above at 70.

118. Consumers are therefore protected against the risk of investment being deterred, because suppliers can propose a customised price-quality path if below normal returns are expected under the default price-quality path.[73]

Why an additional allowance would be unlikely to benefit consumers in the long-term

119. A large additional allowance for suppliers would be unlikely to benefit consumers in the long-term. Our analysis indicates that the additional allowances proposed by regulated suppliers would significantly outweigh any costs associated with a customised price-quality path proposal.[74]

120. We also do not consider that a smaller, but more targeted, additional allowance for suppliers would benefit consumers in the long-term, even after accounting for the cost of a customised price-quality path proposal.[75] The reason is that such an allowance would generally be expected to cost consumers more than they would expect to benefit.

121. The two impacts on consumers of an additional allowance for suppliers are that:

    121.1 First, an additional allowance for the supplier would reduce the probability that a customised price-quality path will be proposed, so the expected cost to consumers of a proposal would be reduced.[76]

    121.2 Second, if the supplier does not propose a customised price-quality path, then the additional allowance for the supplier would mean that consumers face higher prices under the default price-quality path.[77]

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[73] In our view, a customised price-quality path is a valuable option that is not available to consumers, eg, if starting prices are set too high.

[74] For example, in the July 2011 Draft Decision we estimated that the present value of the additional allowance sought by regulated suppliers, over three years, would be worth approximately $9m for Unison, $22m for Powerco, and $41m for Vector. Refer: Commerce Commission, *July 2011 Draft Decision*, above at 15, paragraphs 2.49 to 2.52.

[75] The majority of these costs can be passed onto consumers through higher prices. In particular, the audit, verification, and evaluation costs can be passed on, as well as the application fee.

[76] For example, if the cost of a customised price-quality path proposal was $1m, and an additional allowance reduced the probability of a proposal by 20%, then the expected cost of a proposal to consumers would fall by $200,000 as a result of introducing the additional allowance, ie, $1m multiplied by 20%. In practice, the probability of a customised price-quality path proposal will be determined in part by movements in the WACC. One way to prevent movements in the WACC from affecting the probability of a customised price-quality path proposal would be to apply the WACC from the current regulatory period for the opening years of the term of the customised price-quality path, before using a forward starting rate to estimate the WACC applying during the next regulatory period. We would be interested in receiving submissions on whether we should explore this proposal to potentially take effect in time for the next regulatory period.

122. Our analysis of these two impacts is set out in Attachment J. In summary, we find that the second of the two impacts tends to dominate and, given that suppliers have the option of applying for a customised price-quality path, an additional allowance would be unlikely to benefit consumers in the long-term, or otherwise promote the specific outcomes set out in the Part 4 Purpose.

[77] For example, if the additional allowance is $1m then consumers will pay $1m more through distribution prices.

6. Instances in which alternative rates of change would apply

Purpose of this chapter

123. This chapter explains why we propose to set alternative rates of change for particular suppliers. In summary:

123.1 In our opinion, alternative rates of change are likely to be necessary or desirable to minimise price shocks to consumers; but

123.2 At this stage, we do not have any evidence to suggest that alternative rates of change are necessary or desirable to minimise undue financial hardship to the supplier.

124. We do not consider that suppliers should be able to select their own alternative rate of change. This is because, under the Act, alternative rates of change can only be set if we consider that certain circumstances are met.[78]

Minimising price shocks to consumers

125. If our revised draft decision is implemented, we propose to identify prices shocks with using CPI+10% as a guide.[79] This approach was also proposed in the July 2011 Draft Decision. None of the submissions raised a concern with using 10% as an indication of a price shock.[80]

126. As a general rule, we would seek to minimise any price shocks by spreading the price adjustment over the regulatory period in an NPV-equivalent manner within the regulatory period. This is because we generally aim to set prices that are consistent

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78 PWC and ENA submitted that all suppliers should be able to apply an alternative rate of change, so long as it is net present value neutral, irrespective of any price shock or undue financial hardship. However, s 53P(8)(a) of the Act only allows an alternative rates of change to be applied if, in our opinion, this is necessary or desirable to minimise any undue financial hardship to the supplier or to minimise price shock to consumers. We would therefore welcome any proposals about how alternative rates of change could be set or applied, but evidence would also have to be included to satisfy us that the relevant criteria have been met. Refer: PWC "Submission to the Commerce Commission on 2010-15 Default Price-Quality Path for Electricity Distribution Businesses – Draft Decisions Paper" Made on behalf of 19 Electricity Distribution Businesses, 24 August 2011; Electricity Networks Association "Submission on 2010-15 Default Price-Quality Path for Electricity Distribution Businesses: Draft Decisions Paper" 24 August 2011.

79 It is important to note that individual consumers may experience price increases greater than the permitted increase for an supplier's total revenue for the year of the reset, as prices are reset at an aggregate level and suppliers can choose to adjust individual tariffs (e.g. for different consumer classes) at different rates subject to the overall constraint.

80 We also received some support for using 10% as a guide. Refer, eg: Aurora "Submission to the Commerce Commission on its Draft Decision Paper (July 2011) on 2010-15 Default Price Quality Path for Electricity Distribution", 24 August 2011.

with the amount of revenue that suppliers require to be able to earn a normal return over time.

127. However, in the current context, price shocks are unlikely to be minimised if we spread all proposed price adjustments in an NPV-equivalent manner. This is because the proposed reset would take effect on 1 April 2013, with only two years of the regulatory period remaining. The scope for spreading the largest price adjustments to minimise price shocks is therefore limited.

How we calculated the proposed alternative rates of change

128. Where it is possible to minimise price shocks in an NPV-equivalent manner, as was the case for OtagoNet (CPI+11% in each year), the alternative rates of change that we propose to apply would be:

    128.1 NPV-equivalent to the proposed price path, so suppliers are not made any better or worse off as a result;

    128.2 Calculated as whole numbers; and

    128.3 Less than or equal to the initial price adjustment, eg, CPI+4% would not be followed by CPI+10%.

129. However, where the potential increases are substantial, we have applied a cap of CPI+15% per year. Before we apply claw-back, the outcome for the affected suppliers would therefore be NPV-negative over the remainder of the regulatory period.[81] The cap reflects the fact that, in our opinion, year-on-year price increases that exceed CPI+15% are undesirable for an essential service.

130. In line with our July 2011 Draft Decision, we did consider an NPV-equivalent approach to spreading the largest price increases. Given that we have received submissions supporting NPV-equivalent approaches in the past, we invite further submissions on the approach we are now proposing.

131. However, we propose that claw-back should be applied to the extent necessary for suppliers to be able to earn a normal return from 1 April 2012. For suppliers that are subject to a CPI+15% cap, claw-back will therefore be greater than it would have been otherwise.

132. Consequently, NPV-equivalence would still be achieved for suppliers even if they have their price increases capped at CPI+15%. The only difference is that NPV-equivalence will be achieved over a longer timeframe.

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[81] We signalled the potential for NPV-negative rates of change in the April 2011 Update Paper. Refer, for example: Commerce Commission, *2010-15 Default Price-Quality Path Starting Price Adjustments and Other Amendments: Update Paper*, April 2011, at paragraph 6.24.

No evidence of undue financial hardship for suppliers

133. We are not proposing to set alternative rates of change to minimise undue financial hardship to suppliers. This is because we have not been provided any evidence to suggest that suppliers would face financial hardship, eg, in response to our July 2011 Draft Decision, and the price reductions are of a similar magnitude.

Criteria for identifying undue financial hardship

134. Any supplier that believes the proposed price adjustments will cause undue financial hardship must provide evidence in response to this paper that:[82]

    134.1 The proposed revenue adjustment will, or is likely to, limit the supplier's ability to finance its reasonable investment needs and meet its debt repayments as they fall due.

    134.2 It is not reasonable (and/or possible) for the supplier to address its limited ability to finance its reasonable investment needs and meet its debt repayments as they fall due by altering its behaviour.[83]

135. We invite submissions from suppliers, supported by evidence, as to whether the proposed price changes would cause suppliers undue financial hardship. However, given the size of the proposed reductions, we think it is unlikely that any prudently financed suppliers would face financial hardship on the basis of the figures indicated.

Why we have not relied on a specific threshold for financial hardship

136. We have not identified a threshold for the size of a price decrease that would justify an alternative rate of change. In previous submissions PWC and Vector suggested a CPI-10% threshold;[84] however, we consider it appropriate to allow greater flexibility in determining where undue financial hardship may occur. In addition, undue financial hardship is demonstrable with evidence, and we have not proposed any price reductions that are greater than CPI-10%.

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82 The expenditure objective for customised price-quality paths provides guidance on what is meant by reasonable investment needs. Refer: *Commerce Act (Electricity Distribution Services Input Methodologies) Determination 2010*, 23 December 2010, clause 1.1.4.

83 It may not be reasonable for a supplier to address its financial hardship by altering its behaviour if a change in behaviour would, on balance, have a negative impact on the efficient running of the business.

84 PwC, *Submission to the Commerce Commission on 2010-15 Default Price-Quality Path Starting Price Adjustments and Other Amendment*, 16 May 2011, p. 9; Vector "Submission to Commerce Commission on Additional DPP IMs Process and Issues Paper" 27 January 2012.

7. Application of claw-back

Purpose of this chapter

137. This chapter explains our proposed approach to claw-back. It covers why we have proposed to apply claw-back, and how that claw-back would be applied over time.

Claw-back would allow suppliers to earn a normal return from 1 April 2012

138. We propose to apply claw-back so as to achieve broadly similar outcomes for suppliers and consumers, in net present value terms, as if the price reset had been implemented in full on 1 April 2012.

Claw-back would neutralise the impact of the delay in the reset

139. Prior to the High Court's directions to re-determine input methodologies, price adjustments could have taken effect from 1 April 2012. The earliest that price changes can now take effect is 1 April 2013. We can see no reason why the delays to the process should be allowed to have a positive or negative impact on supplier returns, where such an outcome could be avoided if the price path is reset.

140. We have previously signalled that claw-back for 2012/13 may be applied. In December 2010, in response to concerns about the delay to the reset process, the Chair of the Commerce Commission wrote to suppliers to inform them that claw-back may be applied for 2012/13 if the price path was reset.[85]

Why we have not proposed a general claw-back for other years

141. We do not agree with submissions that have argued that we should apply claw-back for all under- or over-recovery since 1 April 2010.[86] 1 April 2012 provides the relevant date, in our opinion, from which suppliers should have the opportunity to earn a normal return. This is because input methodologies would have been reflected in pricing from that date, had our July 2011 Draft Decision been implemented.[87]

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85 Letter from Mark Berry (Chair, Commerce Commission) to all non-exempt Electricity Distribution Businesses on the Default Price Quality Path – 2012/13 Pricing Year (15 December 2011)

86 Unison "Submission on 2010-15 Default Price-Quality Path for Electricity Distribution: Draft Decision Paper" 24 August 2011; Major Electricity Users' Group "Submissions on additional Input Methodologies – starting price adjustments" 20 January 2012

87 In addition, the majority of submitters during earlier consultation processes provided support for only one year or less of claw-back. Refer, eg: Powerco "Powerco Submission on Additional Input Methodologies for Default Price-Quality Paths: Process and Issues Paper" 27 January 2012; Horizon "Submission to the Commerce Commission on Additional Input methodologies for Default Price-Quality Paths Process and Issues Paper" 27 January 2012; Vector "Submission to Commerce Commission on Draft Decision on Starting Price Adjustments for Electricity Distribution Businesses" 24 August 2011; Wellington

142. As noted in paragraph 131, however, the amount of claw-back applied for some suppliers that face price increases will exceed the amount of any under-recovery in 2012/13. This is because an NPV-negative alternative rate of change would be applied, and so greater claw-back would be required for the supplier to have an opportunity to earn a normal rate of return from 1 April 2012.

How claw-back would be applied

143. This section explains:

143.1 Why no claw-back can be applied in 2013/14; and

143.2 Why we propose to spread claw-back over time.

Why no claw-back can be recovered in 2013/14

144. The first year that claw-back could be recovered is the last year of the current regulatory period. This is because 2014/15 will be the first year that actual quantities for 2012/13 will be available, and those quantities are required to calculate the amount to be clawed back under the requirements for the compliance formula for each path.

Why we propose to spread claw-back over time

145. We are required to spread claw-back over time to minimise price shocks to consumers or undue financial hardship to the supplier. As discussed in Chapter Six, we consider that CPI+15% should apply as a limit on price increases. We therefore propose to spread claw-back over more than one year, including into the next regulatory period, if the CPI+15% threshold is likely to be breached.

146. In assessing whether the CPI+15% threshold is likely to be breached, we will consider the overall impact on prices of both the supplier's rate of change and the claw-back amount. In practice, this threshold only appears likely to be breached in the case of those suppliers that to an alternative rate of change.

147. Given the size of the proposed price increases, we currently expect that:

147.1 Most suppliers will be able to recover the full claw-back amount in 2013/14; and

147.2 Suppliers that are subject to an alternative rate of change will recover their claw-back amounts in the next regulatory period, and we would consult on the appropriate rate of recovery at the time of the next reset (by which time we will be able to factor in the price changes proposed at the time).

148. One issue that we invite submissions on is the appropriate way to calculate the present value of the claw-back amount. We have proposed in this paper that the 75th percentile estimate of the cost of capital should be used, but alternatives include:

148.1 The 50th percentile estimate of the cost of capital; or

148.2 The cost of debt.

149. The draw-back with using the 75th percentile estimate of the cost of capital is that it is likely to be too high. This is because the claw-back amount is a fixed payment, which has nothing to do with the systematic risk of the industry that the supplier is in. Claw-back is therefore more akin to a loan between suppliers and consumers, which would therefore argue for a lower rate to be used.

150. We provide further information on how claw-back is likely to be calculated in Attachment L.

8. Responses to submissions about incentive mechanisms

Purpose of this chapter

151. This chapter provides responses to submissions on incentive schemes that could be applied under the default price-quality path.

Enhancing each supplier's incentive to achieve efficiency gains

152. A supplier's incentive to maintain or achieve efficiency gains tends to diminish towards the end of the regulatory period, as the gains are shared with consumers when prices are adjusted.

153. This diminishing of incentives can be overcome by what are known as 'rolling incentive' schemes, where the benefits of efficiency gains are retained for a fixed number of years, irrespective of when they occurred during the regulatory period. We put in place an incremental rolling incentive scheme (IRIS) in the input methodologies applicable to customised price-quality paths in December 2010.[88]

154. Submitters have requested that we put an IRIS in place for the default price-quality path. Doing so would require an amendment to the existing rules and processes input methodologies for the default price-quality path, which are not the subject of this consultation. We will consider that request further after receiving submissions on the proposed reset.

Staggered sharing proposed by Vector

155. Vector has proposed a staggered sharing mechanism.[89] The staggered sharing mechanism would result in a less pronounced reduction in a supplier's starting price if the supplier is currently earning above normal returns, eg, due to efficiency gains in the supply of regulated services. Vector has argued that this approach would provide greater incentives to make the gains in the first place.

156. We do not propose to apply a staggered sharing mechanism at this reset, because incentive mechanisms only provide benefits to consumers when they have been signalled to suppliers up front. That is not the case for any efficiency gains that were achieved prior to the start of the regulatory period.

157. In addition, two further factors are relevant. First, suppliers will be able to keep the benefits of any efficiency gains that have been achieved since the start of the regulatory period. Secondly, because of our proposed approach to claw-back, any supplier required to reduce their prices would be able to retain the profits earned in the first two years of the regulatory period.

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88 Refer: Commerce Commission, *Input Methodologies Final Reasons Paper*, above n at 41.

89 Refer: Vector, *Efficiency impacts of Starting Price Adjustments – Stylised Example*, 19 December 2011.

158. We do not propose to apply a staggered sharing mechanism in future either. This is due to the adverse incentives that may be created; in particular, suppliers may have an incentive to artificially inflate their returns in the year prior to the adjustment.[90] Starting prices would consequently be higher than they would be otherwise.

159. Finally, a staggered sharing mechanism may also serve to 'lock in' any excessive profits that would be earned in future if prices from before the introduction of Part 4 are continued.[91] As noted by PwC (on behalf of Powerco), the simple staggering mechanism "creates the potential for windfall gains and losses". This is because above normal returns are not necessarily attributable to efficiency gains.[92]

Energy efficiency

160. We have previously received a number of submissions that have argued that explicit incentive schemes should be put in place for energy efficiency, demand side management, and the reduction of energy losses. Under s 54Q of the Act, we are required to promote incentives, and avoid imposing disincentives, for these matters.

161. We do not consider that it would be appropriate to put in place an explicit incentive scheme for these matters to apply in the remaining two years of the regulatory period. The re-determined input methodologies do not give rise to revisiting the determination to enhance the existing structure of incentives.

162. As we noted when the 2010-15 default price-quality paths were first set, we do not consider that our proposed decision imposes any disincentive for suppliers to invest in energy efficiency, demand side management, or for the reduction in losses.

163. Suppliers will retain pricing flexibility to set time-of-use tariffs, eg, peak/off-peak, and seasonal prices. This pricing flexibility allows suppliers to manage peak demand on their networks, which can achieve sub-network peak demand reductions, defer investment, and lower costs, while still generating the same level of revenue.

164. We also consider that it is appropriate to address s 54Q across our regulatory instruments as a whole, rather than through a single instrument in isolation. We are therefore developing information disclosure requirements that capture information on energy efficiency. Suppliers also have the option of proposing a customised price-

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90 For example, suppliers may have an incentive to make early payments for services used in that year, or to delay activities until the next period

91 Some businesses, for example, are likely to be earning relatively high returns at present, simply as a result of prices not yet having been adjusted following the publication of input methodologies.

92 We also considered whether it would be possible to implement a low cost approach to assess whether above normal profits were attributable to efficiency gains. On balance, we concluded that such a scheme would require audit, verification and evaluation processes, which would be too costly to implement under the default price-quality path.

quality path based on, among other things, their policies on distributed generation and non-network solutions.

165. Nevertheless, we will give further consideration to any proposals, including those made in prior consultation, as part of work leading up to the reset in 2015.

Attachment A: Summary of key inputs

Purpose of this attachment

A1. This attachment summarises the key inputs into our financial model for the proposed adjustments for each supplier. The key inputs are:

A1.1 Capex forecasts for 2010/11 to 2014/15;

A1.2 Opex forecasts for 2010/11 to 2014/15;

A1.3 Other regulatory income; and

A1.4 Constant price revenue for 2012/13 2014/15.

Capital expenditure

A2. Our proposed capex allowances are based on estimates of network, and non-network capital expenditure.

A2.1 Network capex is expenditure on assets that form part of the distribution network. We propose to rely on each supplier's forecasts to model their network capex in constant prices.

A2.2 Non-network capex is expenditure on assets that do not form part of the distribution network. We have modelled non-network capex based on each supplier's historic average level of expenditure.[93]

A3. Table A.1 overleaf shows the amount of nominal capex our proposed estimates allow for each supplier each year.

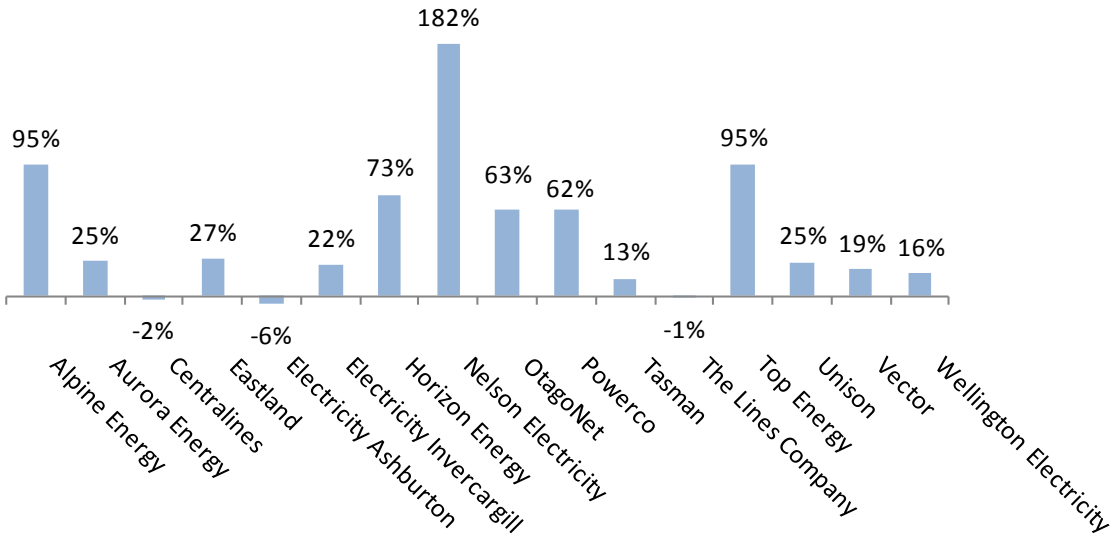
[93] For example, office buildings, depots, workshops, motor vehicles, tools, plant and machinery. These definitions are consistent with those proposed under our information disclosure requirements for suppliers

Table A.1 Nominal capital expenditure forecasts 2010/11 to 2014/15 ($m)

Supplier	10/11	11/12	12/13	13/14	14/15
Alpine Energy	24.1	22.3	29.5	20.3	13.7
Aurora Energy	24.0	26.3	23.0	27.0	26.2
Centralines	6.1	3.5	4.3	3.7	4.0
Eastland	5.5	5.9	5.9	6.0	6.2
Electricity Ashburton	13.3	17.0	10.5	12.1	13.6
Electricity Invercargill	4.1	3.6	3.6	3.2	3.3
Horizon Energy	6.4	6.6	6.1	4.9	5.2
Nelson Electricity	6.2	6.4	1.9	1.6	1.7
Network Tasman	8.7	7.7	6.4	5.7	6.5
OtagoNet	10.6	10.7	11.2	11.2	11.1
Powerco	87.0	91.1	95.8	99.0	103.0
The Lines Company	8.5	8.1	8.5	9.1	8.6
Top energy	15.5	17.6	16.9	16.7	17.6
Unison	43.2	51.8	47.8	50.6	33.7
Vector	138.7	151.2	161.8	172.0	165.8
Wellington Electricity	31.2	34.5	37.6	38.4	40.3
Total	**433.3**	**464.1**	**470.8**	**481.5**	**460.3**

A4. Chart A.1 below compares each supplier's proposed average annual capex allowance for 2010/11 2014/15 to their historic average in constant prices.

Chart A.1 Constant price increase in average capital expenditure allowance for this reset (2010/11 – 2014/15) compared to historical average (2007/08 – 2009/10)



Operational expenditure

A5. Our proposed opex allowances are based on our calculations of the likely trends for each supplier, with an adjustment to reflect the increased insurance costs following the Canterbury earthquake. We consider that trends in supplier opex are influenced by the following three key factors:

A5.1 Network scale – The scale of the network would be expected to affect opex because the volume of service provided will change;

A5.2 Partial productivity – Improvements in opex partial productivity will reduce the amount of opex needed to provide a given level of service; and

A5.3 Input prices – Changes in input prices will affect the annual cost of providing a given level of service.

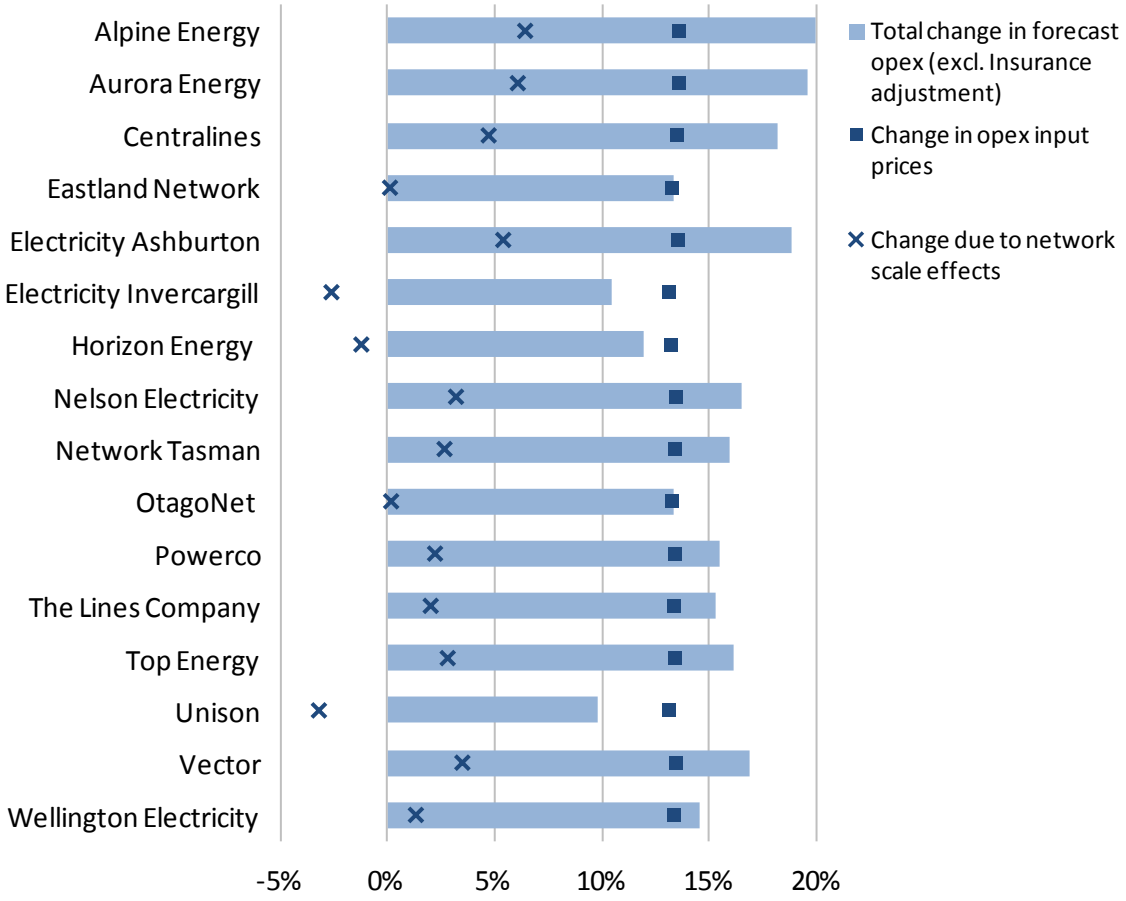
A6. Table A.2 below shows the nominal opex we have allowed for each supplier each year.

Table A.2 Nominal operational expenditure forecasts 2010/11 to 2014/15 ($m)

Supplier	10/11	11/12	12/13	13/14	14/15
Alpine Energy	10.6	11.0	11.4	11.8	12.2
Aurora Energy	19.9	20.6	21.3	22.1	22.9
Centralines	2.7	2.7	2.9	3.0	3.1
Eastland	6.1	6.3	6.4	6.6	6.8
Electricity Ashburton	6.2	6.5	6.7	6.9	7.2
Electricity Invercargill	4.5	4.6	4.7	4.8	4.9
Horizon Energy	6.8	7.0	7.1	7.3	7.5
Nelson Electricity	2.2	2.3	2.3	2.4	2.5
Network Tasman	7.5	7.7	8.0	8.2	8.5
OtagoNet	5.0	5.1	5.3	5.4	5.6
Powerco	67.3	69.5	71.4	73.4	75.6
The Lines Company	8.5	8.8	9.0	9.3	9.5
Top energy	11.5	11.8	12.2	12.6	12.9
Unison	26.6	27.5	28.8	29.5	30.2
Vector	105.5	109.8	113.6	117.4	121.3
Wellington Electricity	29.7	31.0	31.9	33.0	34.1
Total	**320.5**	**332.1**	**343.1**	**353.6**	**364.6**

A7. Chart A.2 below shows the percentage growth in opex from 2010/11 to 2014/15 broken down by the main components. It shows that the changes in input prices are fairly consistent across all suppliers, whereas there are large differences in the change in network scale effects.[94] In some cases, network scale effects were negative.

Chart A.2 Projected growth in operational expenditure from 2010/11 to 2014/15



A8. Table A.3 overleaf shows the historic trend in network length.

[94] Note that the change in partial productivity was 0% for all suppliers and is therefore not shown in this chart.

Table A.3 Historic trends in network length 2003/04 to 2010/11 (,000s km)

Supplier	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	Trend growth (%)
Alpine Energy	3.7	3.8	3.8	3.8	4.0	4.1	4.1	4.1	1.6
Aurora Energy	5.0	5.1	5.3	5.4	5.5	5.5	5.6	5.6	1.6
Centralines	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.7	1.3
Eastland	3.6	3.7	3.7	3.6	3.7	3.7	3.7	3.7	0
Electricity Ashburton	2.7	2.8	2.8	2.8	2.9	2.9	2.9	3.0	1.1
Electricity Invercargill	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	-0.7
Horizon Energy	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	-0.4
Nelson Electricity	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.7
Network Tasman	3.2	3.2	3.3	3.3	3.3	3.3	3.3	3.4	0.5
OtagoNet	4.4	4.4	4.3	4.4	4.4	4.4	4.4	4.4	0.1
Powerco	24.9	26.8	27.1	27.1	27.4	29.3	30.0	29.9	0.5
The Lines Company	4.8	4.4	4.4	4.4	4.4	4.4	4.5	5.0	0.6
Top Energy	3.8	3.9	3.3	3.8	4.1	3.8	3.8	3.8	0.7
Unison	9.2	9.3	9.3	9.4	8.9	9.5	9.6	8.0	-0.9
Vector						17.5	17.6	17.7	0.5
Wellington Electricity						4.6	4.6	4.6	0.2

Note: Due to concerns about the data provided, the trend growth for Powerco is based on the average of the trend growth of all other EDBs. We will review this data further before we make our final decision. Data excluded for Vector prior to 2008/09 as this includes the Wellington Electricity network. Trend growth calculated using a linear regression of ln (network length) on year.

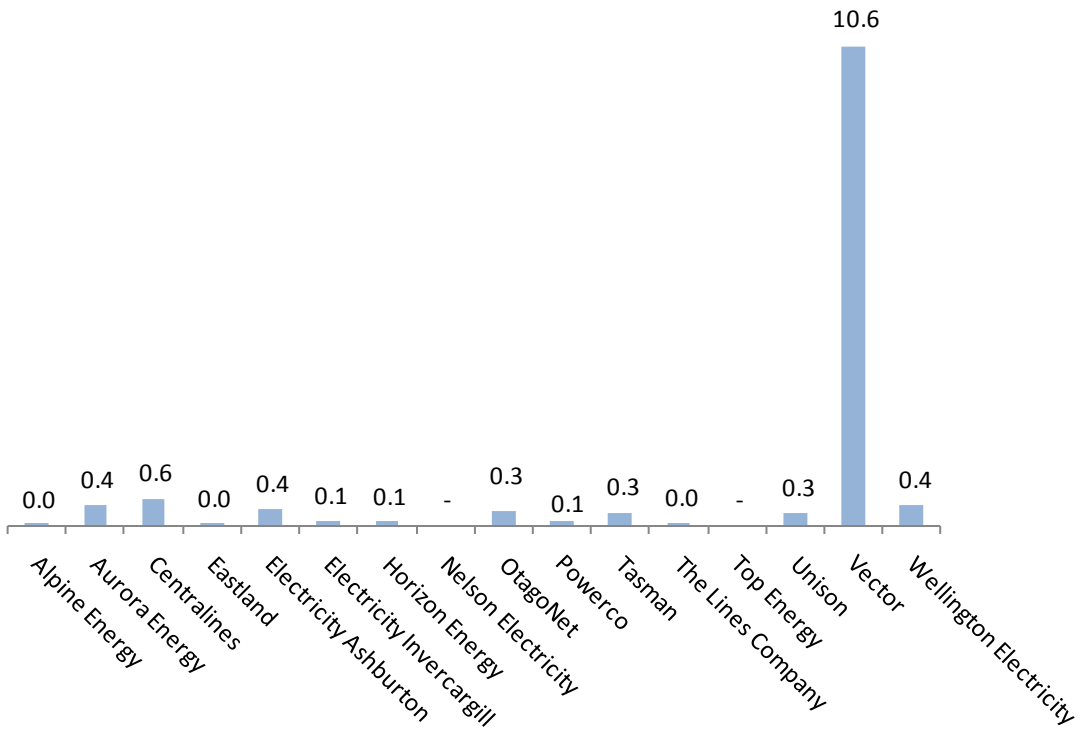
Other regulatory income

A9. Other regulated income is income from the provision of regulated services that is recovered in a different manner from line charges. Examples of other regulated income are lease or rental income from regulated assets.

A10. We propose to estimate each supplier's other regulated income by using an average of their actual figures from 2007/08 to 2010/11. We have excluded a small number of line items that are particularly large and unlikely to reoccur.

A11. Chart A.3 overleaf shows the estimates of other regulatory income we have used in our modelling.

Chart A.3 Other Regulated Income 2010/11 to 2014/15 ($m)

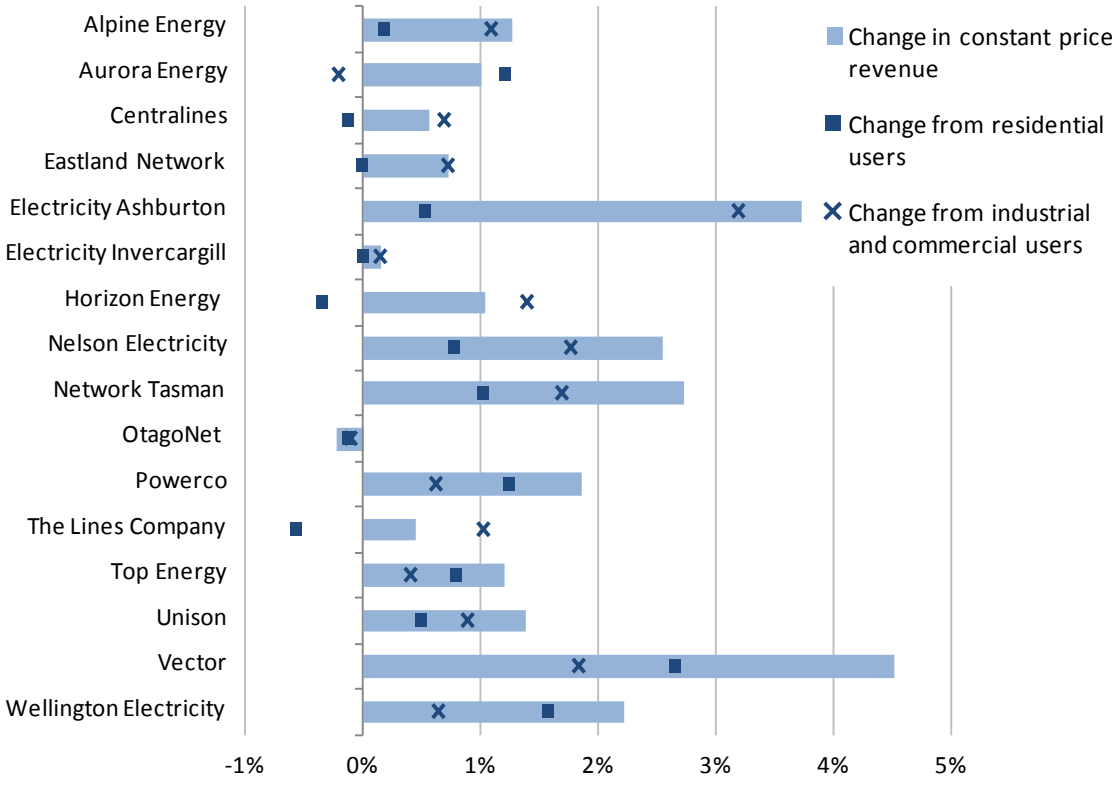


Constant price revenue growth

A12. Constant price revenue growth is the revenue growth that occurs as a result of changes in quantities billed. It is calculated separately for residential users and industrial and commercial users. Constant price revenue from residential users is modelled as a function of the number of residential users and energy use per residential user. Constant price revenue from industrial and commercial users is modelled as a function of GDP.

A13. Chart A.4 overleaf presents the constant price revenue forecasts we have used in our modelling for each supplier.

Chart A.4 Forecast constant price revenue by supplier (cumulative 2012/13 to 2014/15)



Attachment B: How we forecast capital expenditure

Purpose of this attachment

B1. This attachment provides an overview of, and reasons for, our approach to forecasting each supplier's capital expenditure. The capital expenditure forecast is used to calculate the return *on* and *of* capital in Step One in Chapter 4.

We propose to model two categories of capital expenditure separately

B2. We propose to model network and non-network capex in constant prices in separate ways. We treat each category separately because there are differences in:

B2.1 The extent to which forecasts are available;

B2.2 The relative impact on starting prices; and

B2.3 The nature and drivers of expenditure.

B3. We then propose to combine the forecasts for each year and then make an adjustment to reflect the impact of future changes in input prices:

How we model network capital expenditure

B4. We propose to rely on each supplier's 2009/10 forecasts to model their network capex in constant prices. Our modelling assumes that the AMP forecasts are in 2009/10 constant prices.[95]

B5. We have relied on each suppliers forecast because:

B5.1 Suppliers have access to the best information about current and future demand drivers for its services, how to efficiently meet this demand, and the costs incurred in providing the services;

B5.2 This information puts a supplier in a relatively good position (perhaps with some external help) to forecast demand and expenditure requirements for providing the service;

B5.3 Suppliers have an incentive to forecast capex accurately and efficiently through the disclosure of expenditure and associated information in Information Disclosure; and

B5.4 Submissions strongly supported using each supplier's own forecasts.[96]

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[95] In practice a range of different price bases have been used across supplies which include 2009/10 constant prices, 2010/11 constant prices and nominal.

B6. However, if we rely on each supplier's forecasts, we provide suppliers with an incentive to systematically bias their forecast to increase their starting price, eg, by adopting conservative forecasting assumptions. For the reasons set out in paragraph B8.3, however, we do not consider that this is likely to have been caused by incentives that we created.[97]

B7. Also relying on each supplier's forecast potentially reduces the need for a customised price-quality path as any step changes in forecast capex would be incorporated by the default price-quality path, ie, reducing the need for a customised price-quality path.

We propose to use suppliers' 2009/10 forecasts of network capital expenditure

B8. We consider it appropriate to use supplier's 2009/10 forecasts. Submissions generally supported using each supplier's forecasts[98]. Using this data will also:

B8.1 Help ensure that any on-going efficiency gains that were achieved prior to the start of the regulatory period are passed onto consumers in lower prices;

B8.2 Allow suppliers to retain the benefit of any efficiency gains achieved since the start of the current regulatory period; and

B8.3 Help ensure that forecasts are not significantly biased, in either direction, because suppliers did not know that the data would be used for setting starting prices, ie, there was no incentive to inflate forecasts at that time.

B9. We have not accepted submissions that we should use the 2010/11 or 2011/12 capex forecasts as this will:[99]

B9.1 Disadvantage suppliers that have achieved efficiency gains in response to the incentives inherent in the price path;

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96 Horizon "Submission to the Commerce Commission on Additional Input Methodologies for Default Price-Quality Paths Process and Issues Paper" 27 January 2012 at para 40, Powerco "Powerco submission on additional input methodologies for default price-quality paths: process and issues paper" 27 January 2012 at page 11, Vector "Submission to Commerce Commission on Additional DPP IMs Process and Issues Paper" 27 January 2012 at para 95, Wellington Electricity "Additional Input Methodologies: Process and Issues Paper" 27 January 2012 at page 8.

97 Nevertheless, we note that these figures are generally high when assessed against historic levels of expenditure and actual levels of expenditure in 2010/11. Consequently, we think it very unlikely that we would rely on each supplier's forecasts if they were this high in future, given the incentive that suppliers will have to increase their forecast to secure a higher starting price.

98 Ibid, at 4

99 Horizon "Submission to the Commerce Commission on Additional Input Methodologies for Default Price-Quality Paths Process and Issues Paper" 27 January 2012 at para 40, Vector "Submission to Commerce Commission on Additional DPP IMs Process and Issues Paper" 27 January 2012 at para 91

B9.2 Disadvantage consumers of suppliers that have not been able to control expenditure in response to the incentives inherent in the price path; and

B9.3 Potentially result in biased forecasts as suppliers were aware of our proposed approach to base our capex forecasts on the supplier's own forecast following our July 2011 Draft Decision.

B10. An assessment of information disclosure data will assist interested persons (including us) to identify whether a supplier's 2009/10 forecast was higher or lower than that which was actually required. This information will provide helpful context for the next reset.

B11. In its submission Powerco recognised the trade-off between the potentially improved accuracy of more recent forecasts, and the benefit of sharing efficiency gains and losses that may have occurred relative to the 2009/10 AMP forecast.[100] As noted above, we have made this trade-off in favour of suppliers' 2009/10 forecasts.

Capital expenditure forecasts used as a proxy for the value of commissioned assets

B12. We have made a simplifying assumption that the AMP forecasts can be used to forecast the value of commissioned assets. This assumption is appropriate if:

B12.1 The forecast is net of customer contributions;[101]

B12.2 The cost of finance during construction is included in the forecast or is not material to the starting price adjustment; and

B12.3 The forecast is on a commissioned basis (rather than spend basis), or the difference between the two profiles does not significantly affect the starting price adjustment.

B13. We will be issuing a information gathering request to obtain information from suppliers to either:

B13.1 Confirm, if appropriate, that their forecast is net of customer contributions and is in 2009/10 constant prices (with appropriate certification); or

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[100] "Powerco "Submission on Additional Input Methodologies for Default Price-Quality Paths: Process and Issues Paper" 27 January 2012 para 133- Powerco understands the Commission's concern not to penalise suppliers or consumers when adopting the most recent year for the base year. However, that concern must be balanced against the potential advantages of using the most recent information to project profitability. So this is, in Powerco's view, an exercise of judgement for the Commission.

[101] At least one supplier has indicated that its AMP forecast included expenditure that would be funded by customer contributions, ie, gross of customer contributions.

B13.2 Provide an amended forecast that is net of customer contributions and is in 2009/10 constant prices.

B14. We will update our modelling where necessary to reflect any amendments resulting from the additional information we receive.

How we model non-network capital expenditure

B15. We have modelled non-network capex using each supplier's historic arithmetic average level of expenditure for the period 2007/08 to 2009/10 in constant prices. We consider that this approach is appropriate because:

B15.1 We do not have a forecast of non-network capex;[102]

B15.2 The relatively minor size of this type of expenditure;[103]

B15.3 Due to the nature of the expenditure, total non-network capex over the regulatory period is likely to be similar to past levels of expenditure;[104] and

B15.4 We do not consider that changes in scale or partial productivity would have a significant impact on the overall level of required capital expenditure.[105]

B16. As our approach does not include an estimate of the impact of changes in scale or partial productivity the use of the arithmetic average results in a constant (flat) profile in real terms, ie, there is no year on year change. On balance, we have no reason to believe that another profile is more appropriate.

B17. We received no specific comment from submitters to date on how we should forecast non-network capex.

The average is calculated using three years data

B18. We calculated the historic average for non-network capex using data from information disclosure (ID) disclosure years 2007/08, 2008/09 and 2009/10. These are the years for which consistent data is available.

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[102] Suppliers were not required to provide projections in 2009/10, so we do not have these projections

[103] Based on Commission analysis there is an order of magnitude difference in the size of non-network capex compared to network capex ie, on average for the industry spend on network capex is 10 to 20 times larger than non network capex.

[104] Non network capex is made up of a number of unrelated projects with a diverse range of stable drivers related to network scale.

[105] Unlike opex, developing an econometric model for estimating the impact of change in scale and change in partial productivity on non-network capex would not be appropriate given the materiality of non-network capex and the low-cost nature of the default price-quality path.

B19. In reviewing disclosed levels of non-network capex reported by the suppliers, we identified a small number of suppliers who have unusually large levels of non-network capex occurring. Our draft decision includes these actuals in the calculation of the average non-network capex used in our model. However, we may request further clarification from some suppliers on the nature of this expenditure before we make our final decision.

Changes in input prices

B20. To arrive at a nominal estimate of each supplier's capex, we have:

B20.1 Modeled network and non-network in constant prices (as described above);

B20.2 Calculated each annual total; and

B20.3 Applied an input price index to the overall amount.

B21. The most dependable source of information about future changes in capex input prices for each industry is the Capital Goods Price Index (CGPI) for all groups. We consider that this provides a good proxy for industry-specific indices, which are hard to predict individually.

B22. We have used the latest available forecast from NZIER to project input prices for the period 2013 to 15.[106] We propose to use actual changes in CGPI where this is known, which includes the all industries CGPI in 2009/10 and 2010/11. This approach will neither advantage nor disadvantage suppliers that have achieved efficiency gains.

How our approach differs from our July 2011 Draft Decision

B23. The approach we propose differs from the approach we proposed in our July 2011 Draft Decision. Although we relied on suppliers' AMP forecasts, they were applied to our model in a different way:

B23.1 We calculated the annual growth rate of the AMP forecasts (reflecting the forecast growth in network capex);

B23.2 The growth rate was applied to the actual value of commission assets for 2009/10; and

B23.3 The growth rate was applied to both network and non-network capex.

B24. This approach resulted in differences between our forecasts and each supplier's AMP forecast (primarily due to the difference in starting point).

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[106] Under commercial terms between the Commission and NZIER, forecast CGPI may be shared with the industry, but not more widely. Suppliers may request this information from the Commission.

B25. This approach was adopted to address the potential inconsistencies between the AMP forecasts and the input methodology definition of commissioned asset. Using growth rates reduced the reliance on the absolute value instead relying on the rate of change.

B26. We consider that we can address some of these potential inconsistencies by asking suppliers to submit their customer contributions. In addition, as discussed above, finance during construction and the commissioning profile do not have a significant impact on the forecast values.

B27. Our updated approach better reflects our decision to base our capex forecasts on the company's 2009/10 AMP forecast.

Summary of the information sources for modelling capital expenditure

B28. Table B.1 below sets out the information source for all information used to model capex.

Table B.1 Information for modelling capital expenditure

Item	Information used	Source
Network capex	Suppliers annual forecast of network capex	Information disclosures 2009/10 AMP forecast
Non-network capex	Suppliers annual actual non-network capex	Information disclosures actual expenditure for 2007/08, 2008/09 and 2009/10
Change in input prices	Capital Goods Price Index	Independent forecast (NZIER) 2013,2014 and 2015 Actual CGPI for 2010/11 and 2011/12

Attachment C: How we forecast operational expenditure

Purpose of this attachment

C1. This attachment provides an overview of, and reasons for, our approach to forecasting each supplier's operational expenditure. The operational expenditure forecast is used to calculate the required recovery of operating expenditure in Step One in Chapter 4.

Approach for modelling operational expenditure

C2. We propose to model the trend in each supplier's opex, and make an adjustment to this modelled trend to reflect the increased insurance costs to suppliers resulting from the Canterbury earthquakes. We consider this adjustment is appropriate as the increase in insurance costs is largely outside the control of suppliers, is material, and is unlikely to be fully captured in the modelled trend.

Modelling of likely trends in operational expenditure

C3. Trends in supplier opex are influenced by the following three key factors.

C3.1 Network scale – All other things being equal, the scale of the network would be expected to affect opex because the volume service provided will change.[107]

C3.2 Partial productivity – Improvements in opex partial productivity[108] will reduce the amount of opex needed to provide a given level of service; for example, due to changes in technology.

C3.3 Input prices – Changes in input prices will affect the annual cost of providing a given level of service.

C4. It is appropriate to model trends in opex because the majority of opex is 'recurring'. Recurring opex is expenditure that is related to operational activities that are likely to be repeated regularly, and which can be expected to be influenced by certain known and predictable factors.

Why we do not propose to rely on each supplier's forecast

C5. We do not agree with submissions that have argued that our opex modelling should rely on each supplier's forecasts from information disclosure.[109] We consider that there are good grounds for modelling each supplier's opex ourselves as:

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107 For example, every additional km of electricity line constructed will require maintenance, thereby increasing maintenance opex.

108 Opex partial productivity measures changes in the ratio of opex inputs (including operational expenditure) to opex-related outputs.

C5.1 The low cost nature of default price-quality paths, and limits on the use of comparative benchmarking, mean we cannot subject supplier opex forecasts to the same level of scrutiny as for a customised price-quality path; and

C5.2 Opex in these industries is relatively straightforward to model because it is typically recurring and has a reasonably stable trend. [110]

Trends in each supplier's operational expenditure

C6. The trend in each supplier's opex has been modelled using the formula below. This formula results in an adjustment to opex in the previous year based on changes in the scale of the network, opex partial productivity and changes in the cost of inputs used in opex-related activities.[111]

Box C.1 Formula for calculating recurring operational expenditure in each year

opex in previous year

×

(1+ Δ due to network scale effects + Δ opex partial productivity + Δ input prices)

C7. Submissions generally supported the inclusion of one or more of these factors to model opex.[112] We explain below how we have proposed to model each of these factors.

Initial level of operational expenditure

C8. The starting point for this formula is the initial level of opex in the 2009/10 disclosure year. This data is the most recent available prior to the start of the regulatory period. We have also examined historic trends in supplier's opex using information disclosure data and have no reason to consider that opex in 2009/10 was atypical, or that future opex will be materially different from opex in 2009/10.

C9. Using 2009/10 data will also:

C9.1 Help ensure that any ongoing efficiency gains that were achieved prior to the start of the regulatory period are passed onto consumers in lower prices; and

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109 ENA "Submission on Additional Input Methodologies for Default Price-Quality Paths" 27 January 2012 and 29, PwC "Submission to the Commission on Additional Input Methodologies for Default Price-Quality Paths Process and Issues Paper" 27 January 2012 at p. 10.

110 As explained in attachment C, we consider that these factors do not apply in the case of network capex, and so we propose to rely on each supplier's forecasts of this type of expenditure.

111 This approach differs slightly from the approach used to model opex for our July 2011 Draft Decision, where we used real revenue projections to model changes in opex instead of changes in scale.

112 Wellington Electricity "Cross-submission on the Additional Input Methodologies: Process and Issues Paper" 10 February 2012 at 9, Horizon "Submission to the Commerce Commission on Additional Input Methodologies for Default Price-Quality Paths Process and Issues Paper" 27 January 2012 at p. 9.

C9.2 Allow suppliers to retain the benefit of any efficiency gains achieved since the start of the current regulatory period.

C10. We have not accepted submissions that propose we use 2010/11 data as this information will: [113]

C10.1 Disadvantage suppliers that have achieved efficiency gains in response to the incentives inherent in the price path; and

C10.2 Disadvantage consumers of suppliers that have not been able to control expenditure in response to the incentives inherent in the price path.

Changes due to network scale effects

C11. Changes in scale relate to changes in the size of the network and the number of users distribution services are provided to. We consider that changes in scale will affect opex. This view is supported by submissions on the December 2011 Process and Issues Paper and related papers on this topic.[114]

C12. We propose to model changes in opex as a result of the weighted changes in scale for:

C12.1 Expenditure on the network (network opex);[115] and

C12.2 Expenditure to support the network (non-network opex).[116]

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113 Horizon "Submission to the Commerce Commission on Additional Input Methodologies for Default Price-Quality Paths Process and Issues Paper" 27 January 2012 at p. 9, PwC "Submission to the Commerce Commission on 2010-2015 Default Price-Quality Path Starting Price Adjustments and Other Amendments (2)" 23 May 2011 at p. 16

114 Wellington Electricity "Additional Input Methodologies: Process and Issues Paper" 27 January 2012 at p. 9. See also submissions on Commerce Commission "Information Disclosure: Approaches for Understanding EDB and GPB Cost Efficiency", Technical paper for consultation 7 October 2011

115 The historic trend in network length is calculated based on a linear regression of network length and year for each supplier between 2003/04 and 2010/11. Therefore the growth rate is supplier-specific. We have excluded data for Vector prior to 2009/10 as the network length includes the Wellington network now operated by Wellington Electricity Lines. In reviewing this data, we have identified usually large changes in network length for a small number of suppliers in particular years. Our draft decision includes this data. We will review this data further before we make our final decision.

116 Non-network opex includes system operations, network support and business support.

Econometrics to measure the impact of changes in scale on operational expenditure

C13. We have developed econometric models to identify suitable measures of scale and to measure the impact of changes in scale on opex for this reset. This analysis uses historic information disclosure data and indicates that a 1% change in network length will result in a 0.95% change in network opex and a 0.5% change in non-network opex, and that a 1% change in electricity supplied to users will result in a 0.3% change in non-network opex.

C14. Our econometric models used to estimate the relationship between scale and opex are included in Attachment D. These models allowed us to identify the impact of changes in scale on opex instead of assuming a relationship.

C15. Our proposed approach requires us to forecast future changes in scale for network and non-network opex. We have based these forecasts on:

C15.1 Historic trends in network length for each supplier; [117] and

C15.2 Our constant price revenue forecast. We propose to use this forecast as a proxy for future trends in the volume of electricity supplied to users.[118]

C16. Therefore the growth rates are supplier-specific.

Weighting of network and non-network operational expenditure

C17. We propose to weight the network and non-network opex based on the average share of opex that comprises of network and non-network opex. This share has been calculated using operational expenditure data provided in information disclosure in 2009/10 and 2010/11 and gives equal weight to all suppliers, ie, we calculate the arithmetic average.

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[117] The historic trend in network length is calculated based on a linear regression of network length and year for each supplier between 2003/04 and 2010/11. Therefore the growth rate is supplier-specific. We have excluded data for Vector prior to 2009/10 as the network length includes the Wellington network now operated by Wellington Electricity Lines. The trend growth for Powerco is based on the average of the trend growth of all other suppliers. We have identified usually large changes in network length for a small number of Suppliers in particular years. With the exception of Powerco, our draft decision includes this data. We will review this data further before we make our final decision.

[118] We also explored using historic trends in electricity supplied to users. We consider that using the constant price revenue projection better reflects future energy demand than historic trends. As our proposed constant price revenue projection assumes that the price of the lines services remains constant, we consider that it is a suitable proxy for changes in the volume of energy consumed.

C18. We consider it appropriate to apply the same weight to all suppliers. We observed some variation in the share of individual suppliers' opex that consists of network and non-network opex between 2009/10 and 2010/11. We therefore considered there was insufficient time series to calculate weights for individual suppliers that will reflect the future likely share of network and non-network opex.

C19. The resulting weights are:

C19.1 Network opex: 41%; and

C19.2 Non-network opex: 59%

Changes in partial productivity

C20. We propose to assume a 0% change in opex partial productivity for the potential one-off reset. This assumption is informed by analysis provided by Economic Insights and by Pacific Economics Group (PEG) on historical opex partial productivity changes for New Zealand suppliers and overseas electricity distribution suppliers.[119]

C21. An annual opex partial productivity rate of 0% is appropriate on the basis of recent, but likely temporary, declines in the opex partial factor productivity (PFP) growth rate observed for New Zealand suppliers in the Economic Insights and PEG studies, and evidence of ongoing positive opex PFP growth rates for Australian suppliers.

C22. We propose that the change in opex PFP is the same for each supplier. We propose not to use supplier-specific partial productivity estimates as the resulting partial productivity estimate could be inconsistent with the default price-quality path X factor.

Changes in input prices

C23. Opex will be adjusted for forecast changes in the cost of inputs used to operate suppliers using the weighted average forecasts of the changes in the all industries labour cost index (LCI) and the all industries producer price index (PPI). We propose to use forecasts provided by NZIER. [120]

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[119] Economic Insights, "Electricity Distribution Industry Productivity Analysis: 1996–2008", Report prepared for the Commerce Commission, 1 September 2009, Pacific Economics Group, "Reset of Default Price Path for Electricity Distribution Businesses: Submission to the Commerce Commission", Report prepared for the Electricity Networks Association, August 2009, Pacific Economics Group, "TFP Research for Victoria's Power Distribution Industry: 2007 Update", Report prepared for Essential Services Commission, 2008.

[120] Under commercial terms between the Commission and NZIER, forecast PPI and LCI may be shared with the industry, but not more widely. Suppliers may request this information from the Commission.

C24. We do not agree with submissions that have suggested using more sector-specific price indices.[121] Using an all industries forecasts is appropriate as it is likely to provide a good proxy for sector-specific indices, which are hard to predict individually.[122]

C25. We propose to use actual changes in LCI and PPI where this is known for the proposed reset. This includes the all industries LCI and PPI in 2009/10 and 2010/11. This approach should neither advantage nor disadvantage suppliers that have achieved efficiency gains.

C26. We propose to weight the forecast LCI by 60% and the forecast PPI by 40% for the proposed reset. In the absence of labour expenditure data from New Zealand suppliers, these weights are based on analysis of labour expenditure by Australian suppliers.[123]

Adjustment for insurance costs

C27. We propose to include an adjustment for increased insurance costs resulting from the Canterbury earthquakes. We consider that these costs are largely outside the control of suppliers and cannot be captured in our model of the trends in each supplier's opex. We also consider that the inclusion of these insurance costs is appropriate for a default price-quality path as it results from an industry-wide event. Submissions support the consideration of the impact of step changes in insurance costs in our reset.[124]

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121 Powerco "Powerco submission on additional input methodologies for default price-quality paths: process and issues paper" 27 January 2012 and 35, Maui "Submission to the Commerce Commission ("the Commission") on the Process and Issues Paper for "Additional Input Methodologies for Default Price-Quality Paths" 27 January 2012.

122 Based on the limited information available, the all-industries LCI has a correlation of over 97% with the Electricity, Gas, Water and Waste Services LCI. The all-industries PPI has a correlation of 71% with the Electricity, Gas and Water PPI and a correlation of 64% with the Electricity and Gas Supply PPI. Analysis of New Zealand Statistics ANZSIC06 LCI data and NZSIOC PPI (input) data (source: www.stats.govt.nz/infoshare)

123 Pacific Economics Group, TFP Research for Victoria's Power Distribution Industry: 2005 Update, Report prepared for Essential Services Commission, 2006. Meyrick and Associates, The Total Factor Productivity Performance of Victoria's Gas Distribution Industry, Report prepared for Envestra, Multinet and SP AusNet, Denis Lawrence, 2007.

124 Horizon "Submission to the Commerce Commission on Additional Input Methodologies for Default Price-Quality Paths Process and Issues Paper" 27 January 2012 and 7, ENA "Submission on Additional Input Methodologies for Default Price-Quality Paths" 27 January 2012 and 25.

C28. We propose to include the nominal insurance forecasts provided by suppliers in response to the 53ZD information request. To give us assurance that the forecast increases are reasonable, suppliers have been required to have any change in the level of risk, their insurance premiums and any self-insurance allowance independently verified and the associated analysis and documentation certified by a Director.[125]

C29. In reviewing the insurance information we identified a small number of suppliers who forecast unusually large increases in insurance expenditure. Our draft decision includes these forecasts.[126] However, we will review the supporting evidence suppliers have provided to us in more detail and may request further clarification from some suppliers on their supporting evidence before we make our final decision.

Summary of information sources for operational expenditure forecasts

C30. Table C.1 below provides a summary of the information sources that we have relied for each aspect of our modelling of operating expenditure.

Table C.1 Information for modelling operational expenditure

Item	Information used	Source
Insurance adjustment	Suppliers forecasts	Section 53ZD information request
Initial level of opex	Suppliers actual opex for 2009/10	Section 53ZD information request
Changes in scale	Historic trends in network length for each supplier Future trends in electricity supplied to users	Information disclosures Commission constant price revenue forecast
Impact of changes in scale on opex	Historic trends of opex and scale across the industry	Information disclosures
Changes in opex partial productivity	Historic trends of opex and associated inputs and outputs across the industry	Information disclosures
Changes in input prices	All industries PPI and LCI	Independent forecast (NZIER)

[125] Several suppliers have requested their insurance forecasts to be treated in confidence. We have ensured confidentiality by presenting their opex forecasts as an aggregate value in the financial model.

[126] We have also excluded the captive insurance amount submitted by one supplier as it does not meet the criteria for captive insurer.

Attachment D: Econometric analysis of operational expenditure

Purpose of this attachment

D1. This technical attachment explains the econometric analysis of the relationship between supplier scale and its opex. The results from the analysis are used in our forecast of opex.

Overview

D2. This attachment:

D2.1 Summarises the main findings resulting from the econometric modelling of opex;

D2.2 Describes our approach to developing a model of scale;

D2.3 Summarises the data used in our analysis and provides a description of the dataset;

D2.4 Provides the results of our modelling, including how we have assessed the robustness of the analysis;

D2.5 Provides the sensitivity analysis of our econometric model;

D2.6 Explains the limitations of the analysis; and

D2.7 Explains how we have addressed the recommendations from the peer review of our modelling.

D3. The Stata modelling and data files are published alongside this paper.

Summary of main findings

D4. We have used econometric techniques for network opex and non-network opex.

D4.1 The network opex model estimated indicates that a 1% increase in circuit length will on average will lead to a 0.95% increase in network opex, and indicates constant returns to scale for network opex;[127] and

D4.2 The non-network model estimated indicates that a 1% increase in circuit length is on average associated with an increase in non-network opex of 0.5%, while a 1% increase in electricity supplied to installation control points

[127] The coefficient on circuit length is not statistically different from one.

(ICPs) is associated with an increase in non-network opex of 0.3%.[128] The non-network model indicates increasing returns to scale for non-network opex.[129]

Our approach to developing a model of scale and operational expenditure

D5. We modelled the relationship between network and non-network opex, and relevant scale drivers for suppliers across the period 2009/10 to 2010/11. Consistent with industry knowledge, we expected the relationship between scale and opex to be positive, and there are likely to be economies of scale.

D6. We use a log-linear model as we were interested in the impact of changes in scale on opex, rather than the relationship between the level of scale and opex. A standard statistical test also indicates the log-linear model is appropriate.[130]

D7. Given the small number of observations available, we have adopted a pooled cross-sectional model, which treats different suppliers and a given supplier over time as separate data points. We also tested whether the relationship between scale and opex differs by year, and therefore whether a panel model was more appropriate. We found that the relationship between scale and opex does not vary by year, and concluded that a pooled cross-sectional model is appropriate.[131]

D8. We also considered whether to use a weighted or unweighted regression approach. Our view is that an unweighted regression approach is appropriate to derive parameter estimates because we consider it appropriate to provide equal weight to each supplier.[132] The results of the econometric analysis apply to all non-exempt suppliers and we do not therefore consider it appropriate for larger suppliers to influence the results of the analysis.

Data in our analysis

D9. Our starting point for the analysis was information disclosed by suppliers for the period 2003/04 to 2010/11. We reviewed and cleaned the data to the best of our ability. The dataset for estimation includes the following changes:

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[128] An installation control point is a physical point of connection on a local network or an embedded network which the distributor nominates as the point at which a retailer will be deemed to supply electricity to a consumer installation control point (Source: Electricity Authority).

[129] The sum of the coefficient on circuit length and electricity supplied to ICPs is statistically different from one.

[130] We used the Davidson-McKinnon test.

[131] The poolability of the model was assessed using the Chow test and the Zellner-Roy test.

[132] We tested a weighted model based on our preferred models. The weighted model did not result in a statistically different coefficient from the unweighted preferred models.

D9.1 2008/09 data for Vector and Wellington was excluded from the analysis. The sale of the Wellington network by Vector mid-way through 2008/09 could distort the analysis as the expenditure is not representative of a full disclosure year;

D9.2 We excluded network and non-network opex prior to 2009/10 from our analysis ie, we used only two years of data. Not all suppliers provided network and non-network information prior to 2009/10, and we observed inconsistencies in the data that was provided;

D9.3 Network and non-network opex have been converted to 2010/11 real prices using quarterly CPI data from Statistics New Zealand, which we adjusted to remove the impact of the October 2010 GST increase;[133] and

D9.4 No data is available for the Orion network in 2010/11. Orion was granted an exemption to information disclosure following the Canterbury earthquakes.

D10. The dataset provides several potential measures of scale: circuit length, electricity supplied to ICPs, and number of ICPs. The dataset also provides some information on other factors which may help explain the variations in opex between suppliers and over time (for example, ICP density), and in turn may help us to better identify the impact of scale on opex.

Why it is appropriate to base our analysis on 2009/10 and 2010/11 data

D11. We consider that the 2009/10 and 2010/11 data is appropriate to use as we do not have network and non-network opex data for all suppliers prior to 2009/10. While total opex is available prior to 2009/10, we consider separate analysis of network and non-network opex will result in a more accurate opex forecast. The impact of changes in scale is likely to differ for network and non-network opex and these differences are unlikely to be captured in a model of total opex only.[134]

D12. Furthermore, we have no reason to consider that the expenditure and scale data provided in 2009/10 and 2010/11 is significantly different from previous years' expenditure, or significantly different from future likely expenditure. Including 2010/11 data in the analysis simply increases the number of observations available. The increased dataset helps to ensure our analysis is robust.

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[133] A GST adjustment has been included as suppliers do not pay GST and we would not therefore expect their operational expenditure to increase following the GST increase. Using the LCI and PPI (weighted by 60% and 40% respectively) to adjust 2009/10 opex to 2010/11 prices indicates an inflator of 1.03 for 2010/11, compared to 1.02 using CPI. Given the small difference in this inflator, we would not expect the use of the LCI and PPI to inflate data to change the results of our econometric analysis.

[134] We have included 2009/10 and 2010/11 network length data for Powerco in our analysis.

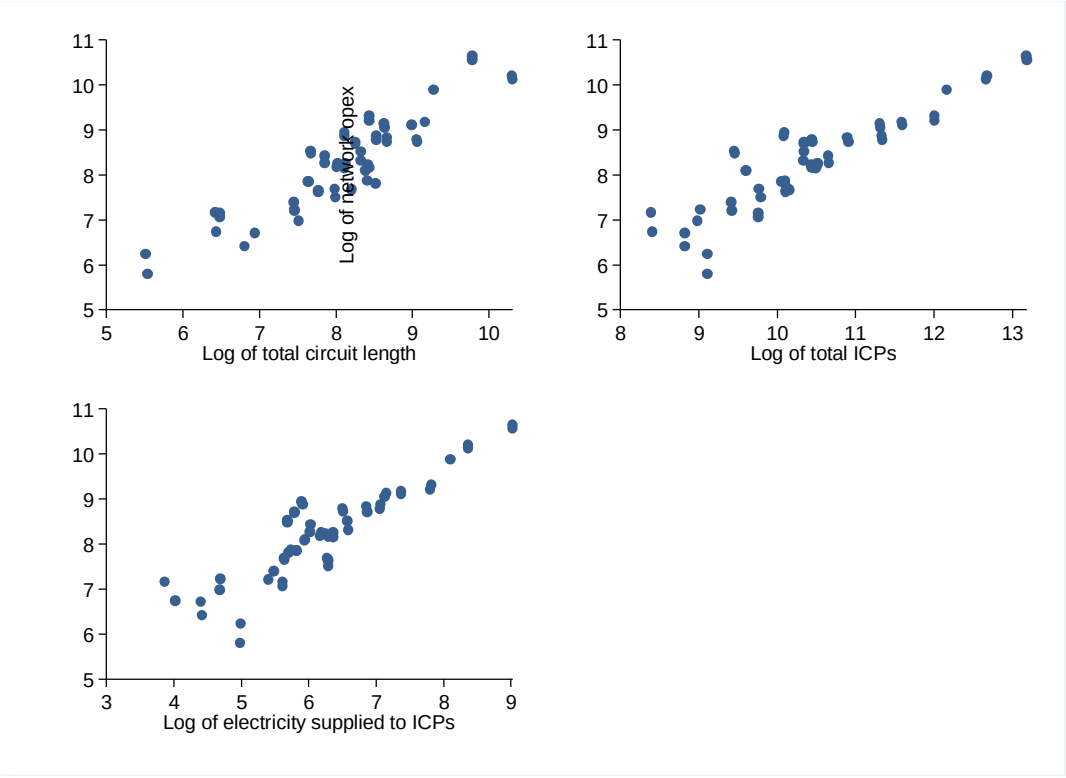
Our econometric model includes both exempt and non-exempt suppliers

D13. While the reset applies to non-exempt suppliers only, we have included data for both exempt and non-exempt suppliers in our analysis to increase the number of observations, and therefore the robustness of our analysis.[135] We have no reason to believe the relationship between scale and opex differs for exempt and non-exempt suppliers. We have tested the impact of excluding exempt suppliers and found that the relationship did not vary for our preferred models and that in cases where it did, it did not materially change the coefficients.[136] However, we have included the results of the analysis on non-exempt suppliers as a sensitivity.

Description of the dataset

D14. The charts below show the relationship between network and non-network opex and the proxies of scale in the information disclosure database: length of network, electricity supplied to ICPs, and number of ICPs. These scatter plots indicate a positive relationship between scale and opex. Our econometric modelling is intended to estimate the impact on network and non-network opex of a change in scale.

Chart D.1 Network opex and scale, 2009/10 to 2010/11 (real prices)

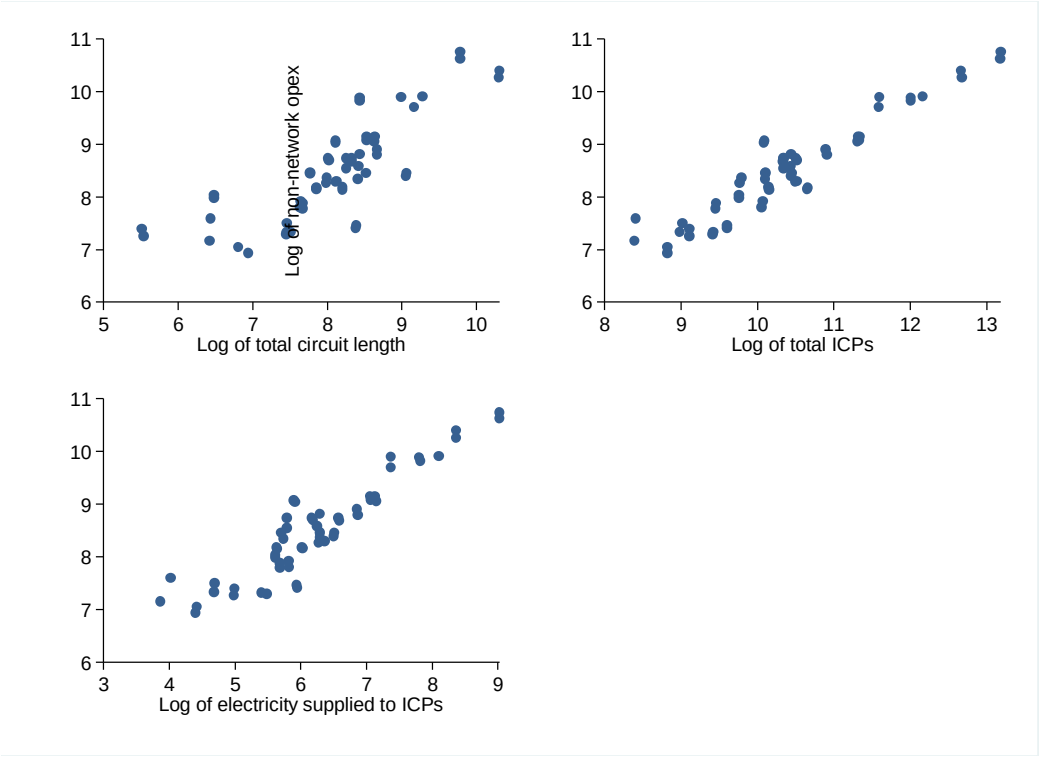


Note: For readability, the graphs do not start at zero.
Source: Commission analysis

[135] The exclusion of exempt suppliers would reduce the number of observations from 57 to 33

[136] We matched NZIER GDP estimates to suppliers using weights based on energy offtake from Grid Exit Points in 2011.

Chart D.2 Non-network opex and scale, 2009/10 to 2010/11 (real prices)



Note: For readability, the graphs do not start at zero.
Source: Commission analysis

Results of our modelling

D15. We explored potential combinations of these measures of scale and other opex drivers, and assessed the statistical robustness of the results and the intuition of the resulting coefficients.

D16. The preferred models, their coefficients, adjusted R^2, F-statistics and the number of observations are summarised below. These models have been chosen based on the results of a number of statistical tests, including diagnostic tests for omitted variables, heteroscedasticity, the results of quantile regression, the intuition and statistical significance of the coefficients, and the reasonableness of their fit, ie, R^2.

D17. The econometric models identified and the results of statistical tests indicate a positive relationship between the measures of scales used, and that there are constant returns to scale for network opex and economies of scale for non-network opex.[137] This is consistent with our expectations.

[137] We used a Wald test to test if the coefficients on the scale variables were statistically different from one.

Table D.1 Network and non-network operational expenditure econometric results

	Network opex	Non-network opex
ln(network length for supply)	0.948***	0.511***
ln(electricity supplied to ICPs)		0.309***
ICPs per km of circuit		0.030***
Constant	0.563	2.068***
Adjusted R^2	0.81	0.87
F-statistic	270	178
N	57	57

Notes: *** significant at 1% confidence level. Models have been estimated using heteroscedasticity-robust standard errors.
Source: Commission analysis

Sensitivity analysis

D18. We tested the robustness of the preferred models by excluding exempt suppliers from the model. We have also included a sensitivity test which excludes suppliers which were identified as outliers based on statistical tests that measure the influence of data points on results.[138] We did not find that the exclusion of exempt suppliers or outliers had a significant effect on our results. The results of this sensitivity analysis are provided below.

The impact of alternative measures of scale

D19. We observe little difference in the statistical properties of the network opex models based on network length and electricity supplied. We prefer the network model that uses network length as we were concerned that the coefficients in the model based on electricity supplied were unexpectedly different for exempt and non-exempt suppliers.

[138] As a broad rule we exclude data points that exceeded the critical values of three out of the four tests we ran on the pooled model. The tests we ran are implemented in Stata and are: **Dfits**, which summarises the information in the leverage versus residual-squared plot into a single statistic; **Cook's distance**, which is a function of dfits and is a metric for deciding whether a particular data point affects regression estimates much; **Welsch's distance**, which is function of dfits; and **Leverage**, which refers to the influence of observations on the estimated relationship.

D20. We prefer the non-network model that uses electricity supplied, network length and ICP density as this model has a higher adjusted R^2 than Alternative models 1 and 2, and we were concerned that coefficients in Alternative model 2 differed across the different quantiles of the model distribution.[139]

Table D.2 Network operational expenditure econometric results

	Preferred model	**Preferred model excl. exempt suppliers**	**Preferred model excl. outliers**	**Alternative model**	**Alternative model excl. exempt suppliers**
ln(network length for supply)	0.948***	0.975***	0.912***		
ln(electricity supplied to ICPs)				0.818***	0.916***
Constant	0.563	0.302	0.821*	3.131***	2.359***
Adjusted R^2	0.81	0.83	0.76	0.80	0.85
F-statistic	270	177	328	264	208
N	57	33	54	57	33

Notes: *** significant at 1% confidence level; * significant at 10% confidence level. Models have been estimated using heteroscedasticity-robust standard errors. Sensitivity excluding outliers omits data for Nelson in 2009/10 and Vector in 2009/10 and 2010/11.
Source: Commission analysis

[139] Our analysis is based on quantile regression of each model.

Table D.3 Non-network operational expenditure econometric results

	Preferred model	Preferred model excl. exempt suppliers	Preferred model excl. outliers	Alternative model 1	Alternative model 2
ln(network length for supply)	0.511***	0.464***	0.503***	0.768***	
ln(electricity supplied to ICPs)	0.309***	0.392***	0.344***		0.768***
ICPs per km of circuit	0.030***	0.027***	0.029***		
Constant	2.068***	1.950***	1.908***	2.286***	3.706***
Adjusted R^2	0.87	0.92	0.88	0.64	0.86
F-statistic	178	383	292	76	415
N	57	33	56	57	57

Notes: *** significant at 1% confidence level; **significant at 5% confidence level; * significant at 10% confidence level. Models have been estimated using heteroscedasticity-robust standard errors. Sensitivity excluding outliers omits data for Buller in 2010/11.
Source: Commission analysis

Limitations of our modelling

D21. Like all econometric analysis, our models have limitations. We have identified two limitations to the models:

D21.1 The relatively small number of observations. We have therefore been limited in the number of explanatory variables we could include in the models, and the econometric method we could use; and

D21.2 There are a limited number of other explanatory factors in the modelling. This may mean that there are omitted variables in our modelling and bias in the coefficients and standard errors arising from this omission. However our objective is to estimate specific parameters rather than a model that fully describes expenditure. We have also tested the models for omitted variables using the RESET test, and could not reject the null hypothesis of no omitted variables for the preferred models.[140]

D22. Overall, we consider our econometric analysis to be robust and therefore appropriate for forecasting opex.

[140] Regression equation specification error test

Peer review of our modelling

D23. Professor Jeff Borland has reviewed a draft of our econometric modelling. His report is published alongside this paper.[141] Table D4 overleaf summarises his recommendations and the action we have taken in response.

Table D.4 Response to recommendations of peer review

Recommendation by Jeff Borland	Our response
Provide reasons why the sample periods used are valid	Addressed in paragraph D11
Motivate analysis with presentation of some descriptive statistics	Addressed in paragraph D14
Expand explanation of specified aspects of econometric modelling	We have included a discussion on the use of non-exempt suppliers in our analysis paragraph D13 A discussion of the dependent variable and the motivation for our econometrics is discussed paras D5-D8, and D19-D20
Include a discussion of how the preferred models are chosen from amongst alternative specifications	Addressed in paragraph D16
Report robustness checks relative to the preferred model	Addressed in the sensitivity analysis in tables D.2 and D.3
Have consistent analysis and presentation of results between modelling revenue and opex	We ensured that the presentation of the results is consistent
Check application of poolability test and consider Zellner-Roy test for poolability as an alternative to Chow test	We have ensured the Chow poolability test has been applied appropriately. We have also tested the poolability of the models using the Zellner-Roy test and found that we can pool data across time, but the result is inconclusive across cross-sections
Check test for poolability between exempt and non-exempt suppliers	We changed the poolability test to include a fixed effect for exempt suppliers. This did not change the results of our analysis
Test for the influence of outliers	Addressed in the sensitivity analysis in paragraph D18
Consider whether weighted or unweighted model is appropriate	Addressed in paragraph D8

[141] Jeff Borland is a Professor in the Department of Economics at the University of Melbourne.

Attachment E: How we forecast other line items

Purpose of this attachment

E1. This attachment explains our proposed approach to calculating other regulated income, disposed assets, and discretionary discounts and customer rebates.

Other regulated income

E2. Our modelling requires the real growth in other regulated income from 2009/10 to 2014/15. Other regulated income is income from the provision of regulated services that is recovered in a different manner from line charges. For example, it includes lease or rental income from regulated assets.

E3. A forecast of other regulated income should be netted off in the calculation of building blocks allowable revenue. While building blocks allowable revenue generally relates to income received from standard electricity distribution line charges, other income they receive is also relevant to determining a supplier's revenue requirement.

E4. We propose to use the arithmetic average of each supplier's other income as a forecast, scaled up for the effects of inflation each year.[142] When calculating the averages we found that some suppliers had one year with unusually large amounts of other regulated income. We reviewed the breakdown of other regulated income to understand whether the type of other unregulated income is likely to be recurring or one-off. From this analysis we modified the calculations for two suppliers:

E4.1 Electricity Invercargill had a particularly large amount of other income in 2007/08. Our average is calculated excluding 2007/08; and

E4.2 In 2008/09 a large proportion of Horizon's other regulatory income was from the proceeds of litigation in terms of its stated 'Committed Supply Agreements'. We have excluded this amount from the calculation as we do not expect such payments to regularly occur.

E5. We also excluded the 2008 value for Wellington Electricity from the calculation as at that time it was still part of Vector.

Disposed assets

E6. To reach this draft decision, we have assumed that forecast disposed assets for each supplier is nil. Forecasts of disposed assets would reduce each supplier's starting price, because the value of a disposed asset must be removed from the RAB.

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[142] We asked for other regulated income for the years 2007/08 to 2010/11 in – Commerce Commission "Notice to supply information to the Commerce Commission under section 53ZD of the Commerce Act 1986" (22 June 2012).

E7. We are aware that this assumption is inconsistent with our treatment of losses on disposal. Losses on disposal are included in the initial level of opex that we use to forecast opex. The opex forecast is therefore higher than it would be if we expected there to be no assets disposals during the period.

E8. Consequently, we intend to request information from suppliers to better understand the extent of past asset disposals, and the extent of losses on those disposals. We would expect that our final decision would use an assumption that was broadly consistent across both items. For example, by using a historic average for each item.

Discretionary discounts and customer rebates

E9. Some suppliers of electricity distribution services provide returns to their owners through a range of mechanisms, including rebates, discounts, line charge holidays, and dividends.

E10. These 'discretionary discounts and customer rebates' (as opposed to posted discounts, which are not discretionary once posted) are not treated as a building blocks cost for the purposes of determining revenue requirements under our modelling. Neither are they treated as a tax deductible expense for the purposes of calculating tax costs.

E11. We consider that this approach is appropriate because under a low cost default price-quality path we cannot verify forecasts of discounts that are up to the discretion of the supplier to make.

Attachment F: How we forecast constant price revenue

Purpose of this attachment

F1. This attachment explains how we have forecast constant price revenue for each supplier. These forecasts are used in Step Two of our approach to setting starting prices in Chapter 4.

Overview of the approach to modelling constant price revenue

F2. To calculate net revenue for each supplier, we require constant price revenue forecasts for the present value period, ie, 1 April 2012 to 31 March 2015.[143] These forecasts are used along with forecasts of the CPI to estimate the amount by which each supplier's revenue will change under the reset default price-quality path.

F3. Our approach involves modelling constant price revenue separately for residential users, and industrial and commercial users.[144] We have relied on information provided by suppliers under an information gathering request to classify revenue into those two categories, and have modelled the impact of changes in drivers on the quantities a supplier charges for.

F4. Revenue from residential users is modelled as a function of the number of residential users and energy use per residential user. Revenue from industrial and commercial users is modelled as a function of GDP.

Changes to our approach since our July 2011 Draft Decision

F5. The approach we propose is different to the approach we proposed in our July 2011 Draft Decision. In that paper, we modelled constant price revenue by tariff type, whereas now we model by type of users. However, the updated approach has the benefit of being simpler and internally more consistent than the approach we proposed previously.[145]

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143 The forecasts of constant price revenue for 2012/13 and 2013/14 are also used to calculate $\Delta D_{2012/13\text{-}2013/14}$ discussed in Attachment L.

144 We use users throughout this paper to describe the technical term installation control point (ICP). An installation control point is the physical point of connection on a local network or an embedded network which the distributor nominates as the point at which a retailer will be deemed to supply electricity to a consumer. (Source: Electricity Authority).

145 For example, our previously proposed approach relied on external energy volume forecasts which may have used input data, eg, on GDP forecasts, that were inconsistent with other data.

F6. We have therefore adopted an approach that was suggested by Unison in its suggestion. Unison proposed to model electrical energy delivered separately for residential and commercial users. It proposed to model residential energy use based on population and energy use per residential customer, and commercial energy use based on real GDP.[146]

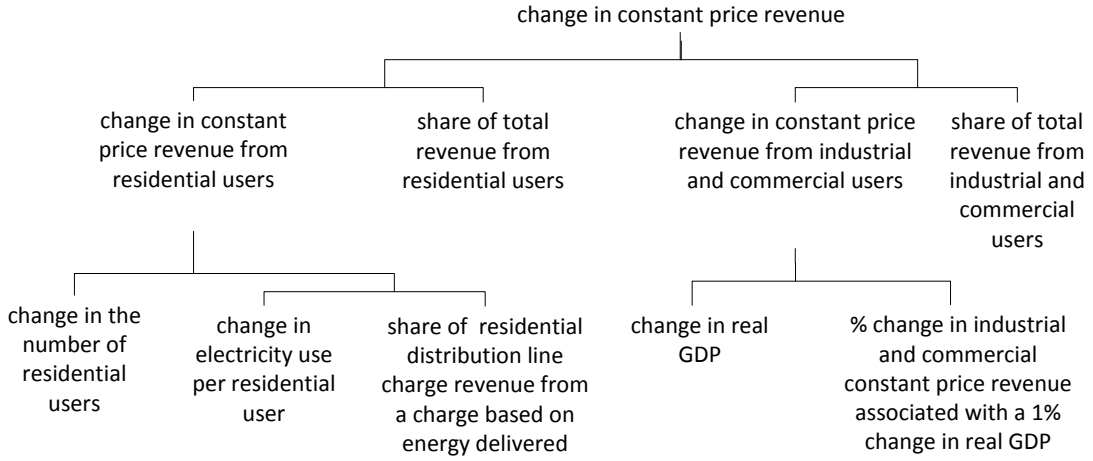
F7. Wellington Electricity submitted that revenue forecasts should be determined by an independent forecaster appointed by the supplier. These forecasts should be regional and recognise the different drivers of growth for variable, fixed, and demand/capacity based charges.[147] We consider that such an approach would be appropriate under a customised price-quality path where a supplier proposes forecasts, accompanied by independent assurance from an independent verifier, but not in the context of a default price-quality path.

F8. Vector suggested that the Commission and interested parties should jointly commission independent forecasts of inputs.[148] The forecasts of inputs we propose to use are independent.

We separately model revenue from two user groups

F9. The figure below gives an overview of our approach involving modelling of two main user groups—residential users and industrial and commercial users.

Figure F.1 Approach to modelling constant price revenue for suppliers of electricity distribution services



146 Unison "Submission on 2010-2015 Default Price-Quality Path for Electricity Distribution: Draft Decisions Paper" 24 August 2011, p14.

147 Wellington Electricity "Additional Input Methodologies: Process and Issues Paper" 27 January 2012, p9.

148 Vector "Submission to Commerce Commission on Additional DPP IMs Process and Issues Paper" 27 January 2012", para 93.

F10. Below we explain the role of each of the elements outlined above, how they fit together and our reasons for adopting the proposed approach.

F11. The following box sets out the formula for calculating the change in constant price revenue for each supplier.[149]

Box F.1 Change in constant price revenue for each supplier

Δ constant price revenue from residential users

x

share of total revenue from residential users

+

Δ constant price revenue from industrial and commercial users

x

share of total revenue from industrial and commercial users

F12. Suppliers of electricity distribution services use a combination of charges, including those based on the quantity of energy delivered to users, quantities relating to peak demand, measures of the quantity of capacity provided by the network connection, and annual charges per user.

F13. Our analysis of information from an information request shows that there is significant variation among suppliers in the structure of their charges and the amount of revenue they get from different types of quantities they bill for. Suppliers tend to get a greater share of their revenues from charges based on the quantity of energy delivered from residential users, whereas for industrial and commercial users a greater share of revenues is from demand or capacity based charges.[150]

F14. Suppliers choose what type of quantities they charge for (in most cases suppliers charge retailers). Our approach reflects information from each supplier on their choices. To this extent the forecast is tailored to each supplier. Suppliers can also structure their tariffs according to their own policy and can restructure their tariffs as long as they stay under the weighted average price cap. Our approach assumes that the structure of tariffs stays constant over the default price path regulatory period.

F15. For further discussion of the information from suppliers we used for the modelling refer to Attachment G.

F16. Each element of the formula, and the information we used are described below.

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149 We use Δ to denote the % change in data from one information disclosure year to the next.

150 Attachment G includes descriptive statistics of the information suppliers gave us in response to the s 53ZD information request that illustrate the proportion of revenue suppliers derive from different types of quantities they charge for.

Modelling constant price revenue from residential users

F17. The formula for calculating the change in revenue from residential users is set out in the box below.

Box F.2 Change in constant price revenue from residential users

Δ number of residential users
+
Δ energy use per residential user
x
share of residential distribution line charge revenue from a charge based on energy delivered

F18. Residential users have broadly similar demand characteristics.[151] It reasonable to assume that as a starting point:

F18.1 Existing residential users will on average continue to be billed the same quantities as in the recent past; and

F18.2 New connections will on average be billed on the basis of the same quantities as existing users.

Change in the number of residential users

F19. One of the drivers of the forecast change in constant price revenue from residential users therefore is the change in number of residential users.

F20. Submissions suggested that we rely on forecasts of changes in the number of installation control point from supplier's asset management plans as an alternative to the population growth forecasts.[152] We do not know the quality of suppliers' forecasts and whether these forecasts can be considered more accurate than population forecasts. NZ Statistics population forecasts are widely used and we consider it appropriate to rely on these for this reset.

F21. To model the impact from changes in residential users we propose to use population forecasts from Statistics New Zealand as a proxy.

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151 See Attachment G.

152 Horizon "Submission to the Commerce Commission on 2010-15 Default Price-Quality Path Reset of Starting Prices, CPI Adjustments and Other Amendments Draft Decisions Paper" 24 August 2011, p15. Vector "Submission to Commerce Commission on Draft Decision on Starting Price Adjustments for Electricity Distribution Businesses" 24 August 2011, p25.

Change in energy use per residential user

F22. We then refine this starting point. Energy use per user may change over time. Most suppliers obtain a large share of line charge revenue from residential users based on the quantity of energy delivered. On average across the industry around two thirds of suppliers' line charge revenue comes from energy delivered. [153]

F23. Given the importance of energy quantities as a basis for billing, constant price revenue from that basis may change over time because of changes in the size of households and changes in consumption patterns. We propose to allow for this by modelling the impact on revenue from changes in average energy used per residential user.

F24. When assessing historic trends we found that average energy use per user has varied from year to year, but overall has been flat. This overall trend may have been due to increases in consumption from increases in income being offset by improvements in energy efficiency or substitution towards other energy sources, such as gas.

F25. Therefore, although in theory the change in energy per residential user may drive constant price revenue, based on our assessment set out in Attachment G we propose to adopt an industry wide assumption in change in energy use per residential user of zero.

Information used for modelling residential users

F26. Table F.1 overleaf summarises, for each component, the information we used to model the change in constant price revenue from residential users. As discussed in Chapter 4, we have used the most up-to-date forecast information because it is unlikely to penalise a supplier for efficiency gains since the start of the regulatory period. The data sources we have used are:

F26.1 Territorial Local Authority population forecasts which we matched to suppliers' operational regions;

F26.2 Regional GDP forecasts from NZIER which we matched to suppliers' Grid Exit Points;

F26.3 Revenue shares based on the latest available data for 2010/11 from an information gathering request; and

F26.4 Data from the Ministry of Business, Innovation and Employment Energy to determine the change in energy use per residential user.

F27. For further discussion on the information we use refer to Attachment G.

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[153] See Attachment G.

Table F.1 Information for modelling change in constant price revenue from residential users

Item	Information used	Source
Change in residential users	Supplier-specific population forecasts	Statistics NZ Information from s 53ZD request Commission calculations and assumptions to match data to each supplier's operational area
Change in energy use per residential user	Industry wide historic trends	Ministry of Business, Innovation and Employment Commission calculations
Share of residential distribution line charge revenue from a charge based on energy delivered	Supplier-specific information on different categories of line charge revenue	Section 53ZD information request Commission calculations
Share of total revenue from residential users	Supplier-specific information on different shares of line charge revenue	Section 53ZD information request Commission calculations

F28. The formula for calculating the change in revenue from industrial and commercial users is set out in the box below.

Box F.3 Change in constant price revenue from industrial and commercial users

Δ real GDP
x
% Δ industrial and commercial constant price revenue associated with a 1% Δ in real GDP

F29. Industrial and commercial users comprise a wide range of users in terms of their demand for energy and peak capacity. Their demand for electrical energy and capacity may vary from being similar to that of residential users (for example, small shops) to being significantly greater than that (for example, energy intensive industrial users).

F30. Between 2007/08 and 2010/11, on average across non-exempt suppliers of electricity distribution, around two thirds of line charge revenue was from charges based on maximum demand or capacity. One third of charges were based on energy delivered. For most suppliers this relationship changed very little over those four years. [154]

[154] See Attachment G.

F31. We propose to use regional GDP growth as the driver for modelling constant price revenue from industrial and commercial users. By using a single driver for different types of quantities charged, we assume that economic growth increases revenue from charges based on maximum assessed or actual capacity demanded and energy consumption in the same proportion.

F32. To translate the change in regional real GDP into constant price revenue for industrial and commercial users we need information on the relationship between changes in real GDP and constant price revenue.

F33. We undertook econometric modelling of revenue and, based on this modelling, determined that a 1% change in real GDP is associated with a 0.52% change in industrial and commercial constant price revenue. For a discussion of our econometric modelling refer to Attachment G.

Information used for modelling industrial and commercial users

F34. Table F.2 overleaf summarises, for each component, the information we used to model the change in constant price revenue from industrial and commercial users.

F35. Similar to information for residential users, we have adopted a pragmatic approach and used actual data where it is available and used the latest available forecasts. As discussed in Chapter 4, we have used the most up-to-date information because it is unlikely to penalise a supplier for efficiency gains since the start of the regulatory period. The in data sources we have used are:

F35.1 Actual estimates and forecasts of regional GDP from NZIER, to calculate a supplier-specific forecast of GDP;

F35.2 Revenue shares based on the latest available data for 2010/11 from an information gathering request; and

F35.3 The latest available data for 2010/11 for our econometric modelling.

F36. For further discussion on the information we use refer to Attachment G.

Table F.2 Information for modelling change in constant price revenue from industrial and commercial users

Item	Information used	Source
change in real GDP	Supplier-specific forecast of regional GDP growth	NZIER
	Energy used by GXP	Electricity Authority
		Commission calculations and assumptions to match data to the area of each supplier's network
% change in industrial and commercial constant price revenue associated with a 1% change in real GDP	Industry wide estimate	Section 53ZD information requests
	Historic information on real GDP and line charge revenue	econometric modelling undertaken by Commission
share of total revenue from industrial and commercial users	Supplier-specific information on different shares of line charge revenue	Section 53ZD information request and Commission calculations

Attachment G: Econometric analysis of revenue

Purpose of this attachment

G1. This attachment explains how we estimated the relationship between industrial and commercial constant price revenue and GDP. These results are used to forecast industrial and commercial constant price revenue explained in Attachment F.

Overview

G2. This attachment:

G2.1 Summarises our main findings resulting from the econometric modelling of revenue;

G2.2 Describes our approach to developing models of GDP and revenue;

G2.3 Summarises the data used in our analysis and provides a description of the dataset;

G2.4 Provides the results of our modelling, including how we have assessed the robustness of the analysis;

G2.5 Explains the limitations of the analysis; and

G2.6 Explains how we have addressed the recommendations from the peer review of our modelling.

G3. The Stata modelling and data files are published alongside this paper.

Summary of main findings

G4. The main findings from our econometric analysis are:

G4.1 Our preferred model estimates that a 1% increase in real GDP is associated with a 0.52% in revenue.[155] Using our preferred dataset, and using alternative model specifications, resulted in a range of estimates between 0.50 and 0.67; and

G4.2 We consider that it is possible to establish a statistically robust relationship between revenue and real GDP. We consider it appropriate to assume that the same relationship also applies to the relationship between constant price revenue and real GDP for the regulatory period. We extensively tested the robustness of our modelling and an experienced econometrician peer reviewed our work.

[155] Our preferred model is the random effects model for cross sections using line charge revenue from information disclosures.

Our approach to modelling GDP and revenue

G5. Our empirical analysis aims to identify the percentage change in constant price revenue from industrial and commercial users that is associated with a 1% change in real GDP. The relationship between revenue and GDP can be expected to be positive, as greater economic activity can be expected to be associated with a greater use of electricity (and hence revenue) over time.

G6. We do not expect the relationship to be 1:1 for a range of reasons. For example, suppliers base their charges on a range of billable quantities, some of which can be expected to vary with GDP positively, eg, capacity and energy, others that may not vary by as much, eg, fixed per user.[156]

G7. We do not have direct information on constant price revenue. We have, therefore, modelled a proxy for constant price revenue from two databases (information disclosures and s 53ZD information request), which we deflated by the consumer price index.

G8. Each of the proxies for constant price revenue has advantages and disadvantages, which are further discussed below.

G9. We modelled the natural logarithm of GDP and revenue. Using this specification means that the coefficient of the models can be interpreted as an elasticity, which is what we require for our forecast of constant price revenue.

G10. We have used data on non-exempt suppliers of electricity distribution services, and fitted models across suppliers and over time. We discuss this further below.

G11. We estimate a range of models that make use of both time series and cross-sectional variation, making different explicit or implicit assumptions about the relationship between individual data points, ie, the observed variation in explanatory and dependent variables, and the error term. [157]

G12. The use of panel data allows us to estimate and test for robustness extensively a range of model specification. In the present context, it is preferable to focus on panel data rather than on models using either time series variation or cross-sectional variation.

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[156] Observed over a sufficiently long time period energy intensity may change due to a change in industrial composition or responses to changes in the price of electricity and substitutes.

[157] We used one-way error component models, which allow for either supplier-specific effects or time effects. We also tried fitting two-way error component models. We found that in the fixed effects model GDP was statistically insignificant.

G13. Table G.2 below explains the different specifications we modelled. [158]

Table G.1 Comparison of alternative model specifications

Pooled model	Fixed effects model	Between effects model	Random effects model
A pooled model is where time series and cross-sectional observations are combined or pooled together in a common model	A fixed effects model treats panel-specific errors as fixed parameters These parameters are panel-specific intercepts and therefore allow the conditional mean of the dependent variable to vary across panels	The between effects model, also called group mean regression, uses group means of dependent and independent variables	A random effects model for panel data treats the panel-specific errors as uncorrelated random variables drawn from a population with zero mean and constant variance
The dependent variable and independent variables are both time-varying and varying across cross-sections	This model relies on the intra-cross-section or time variation characteristic of individual time series	This model only uses the between-panel variation in the data to estimate parameters, ignoring any within-panel variation	This model considers both within and between time or cross-sectional effects

Source: Commission analysis.

G14. We also considered whether to use a weighted or unweighted regression approach. Our view is that an unweighted regression approach is appropriate to derive parameter estimates because it provides equal weight to each supplier included in the modelling. A given data point should contribute equally to the result (provided, it does not influence the statistical robustness of the model, see further discussion below). [159]

Data used for our analysis

G15. We modelled two data series of revenue as our dependent variable. The data sources and time-periods are:

G15.1 ID, covering the period from 2003/04 to 2010/11; and

[158] The results from these different specifications differ due to the differences in intercept specification, error variances and estimation techniques.

[159] We tested a weighted regression approach as sensitivity. This increases the statistical significance of the pooled model and fixed effects model and the coefficient for GDP changes somewhat.

G15.2 Section 53ZD information requests (s 53ZD), covering the period from 2007/08 to 2010/11.

G16. We do not have direct information on constant price revenue so both are only a proxy for constant price revenue from industrial and commercial users, but we do not consider that the consequences are serious. The advantages and disadvantages of each data series are:

G16.1 The ID revenue series has the advantage of covering a longer time period, but it also includes revenue from other sources (eg residential users); and

G16.2 The s 53ZD data series is only revenue on industrial and commercial users, but it is over a shorter time period.

G17. We expect on average across the industry and over time for there to be reasonably close relationship between revenue and constant price revenue. However, there will be differences that matter, for example some suppliers have increased their prices by significantly more than CPI.

G18. From an econometric estimation viewpoint, we recognise that there may be some 'measurement error' in the dependent variables, but we do not consider the consequences to be serious.[160]

G19. We welcome suggestions from submitters on additional ways of developing a dependent variable for the modelling discussed in this attachment.

G20. As we explain below, the modelling based on the s 53ZD data is of limited robustness (likely due to the limited data available across time). We found the information useful to examine as part of our exploratory analysis how well total revenue from ID proxies revenue from industrial and commercial users.

G21. Our analysis uses data for non-exempt suppliers of electricity distribution services only as the default price path only affects non-exempt suppliers. The data set contains a sufficient number of data points from non-exempt suppliers that allows us to develop a robust model of revenue, without using data for exempt suppliers.

Revenue from information disclosures

G22. Information disclosures contain total line charge revenue and we have modelled this data for the period 2003/04 to 2010/11.

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[160] The consequence of the measurement error that results from modelling revenue is an increase in the error variance of the estimator but is unlikely to bias coefficient estimates in sufficiently large samples. We also do not expect the measurement error to be related to the GDP explanatory variable. For a discussion of the consequences of measurement error, see J.M Wooldridge Econometric Analysis of Cross Section and Panel Data" The MIT Press, 2002.

G23. We converted the revenue to 2010/11 real prices to get close to a measure of constant price revenue.[161] The modelling excludes data for 2008/09 for Wellington and Vector. The sale of the Wellington network by Vector mid-way through 2008/09 could distort the data for the revenue in the 2008/09 information disclosure. The modelling also excludes data for 2010/11 for Orion because no data is available for the Orion network in 2010/11 due to the Canterbury earthquakes.

G24. As part of the testing for influential data points we excluded additional observations which we discuss further below alongside the modelling results.

Revenue from section 53ZD information request

G25. The information suppliers provided to us under an information request we issued in April 2012 included line charge revenue from industrial and commercial users.

G26. We used the same approach as above to convert the data to real 2010/11 values and excluded the same observations.

Regional GDP matched to the area covered by each supplier's network

G27. We constructed the independent variable in the modelling using a similar approach as that used to construct a forecast of GDP for each supplier (see Attachment F). The historic time series of suppliers uses historic estimates of regional real GDP from NZIER's Quarterly Predictions, matched to suppliers' operational regions. [162]

G28. To the extent that the match between supplier area and GDP is imperfect the accuracy of the estimates may be reduced.

Description of the dataset

G29. As a starting point for our econometric modelling we explored our dataset. We present the key insights from this assessment below.

Revenue from information disclosure data

G30. The chart two pages overleaf shows the relationship between total revenue and regional real GDP for each supplier between 2003/04 and 2010/11 based on information disclosure revenue.

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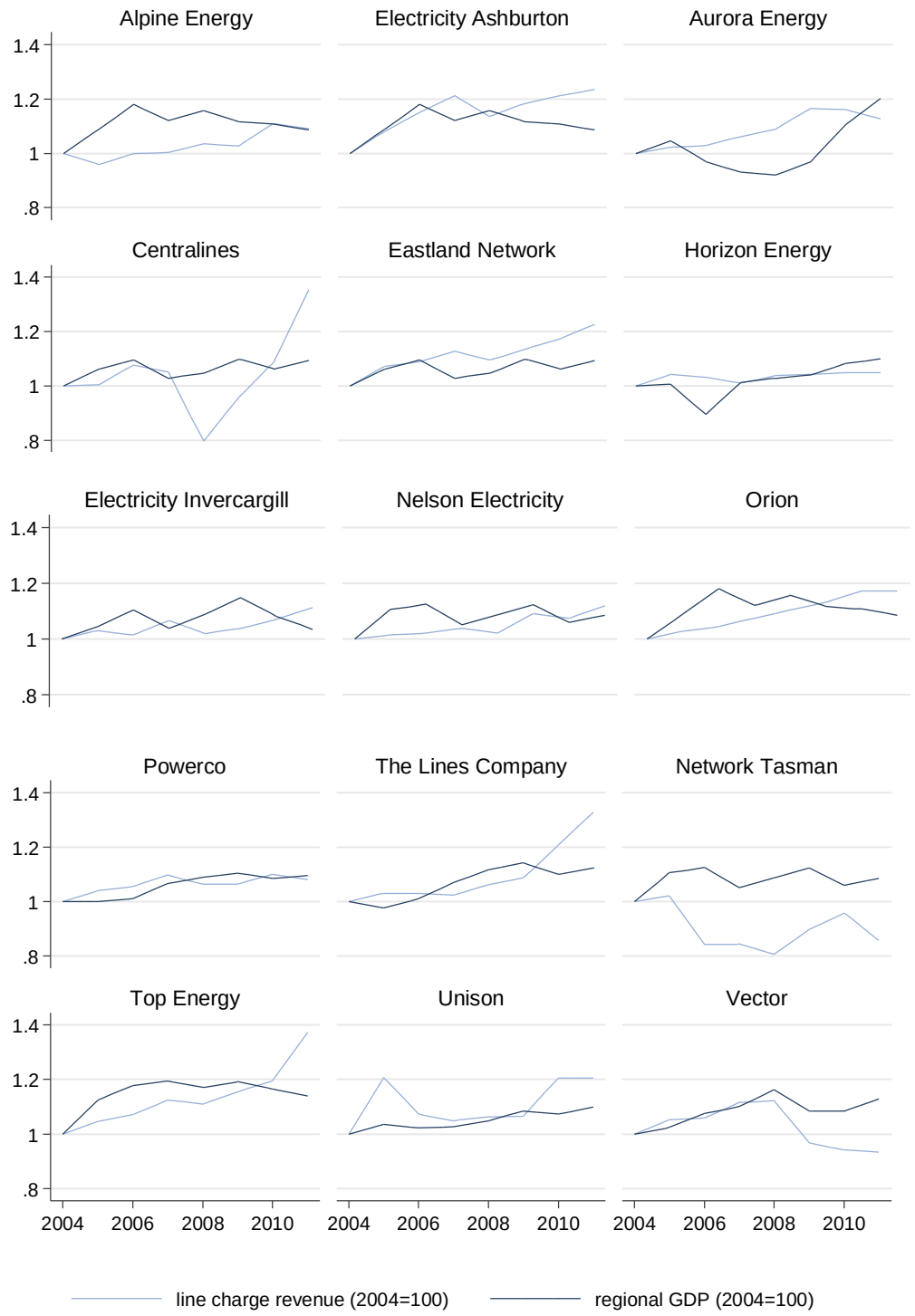
[161] We have used CPI data from Statistics New Zealand, adjusting the series also to remove the impact of the 2010 GST increase. To the extent that suppliers did increase their prices by actual CPI, the adjusted revenue series overestimates the actual change in constant price revenue from 2009/10 to 2010/11.

[162] We matched NZIER GDP estimates to suppliers using weights based on energy offtake from Grid Exit Points in 2010/11.

G31. While overall there is a broadly observable relationship, there are some suppliers for which the relationship between revenue and GDP is less pronounced than others, with Aurora, Centralines and OtagoNet standing out in particular. This is likely to be due to a combination of factors. For example, revenue can increase due to increases in quantities billed (eg, energy or demand) or due to increases in prices, the latter being unrelated with GDP.

G32. We formally tested for the impact of influential observations on the estimated average relationship between revenue and GDP and discuss our findings overleaf.

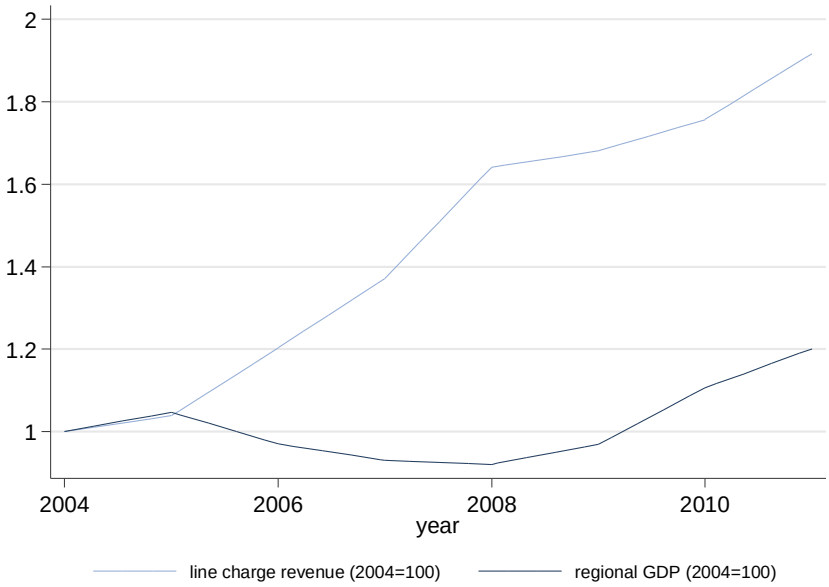
Chart G.1 Line charge revenue and regional GDP



Note: Wellington not shown as this network only has data from 2008/09 to 2010/11. For readability the graphs do not start at zero.
Source: Commission analysis.

G33. Chart G.2 below shows OtagoNet's revenue and regional GDP. The previous chart (G.1) excludes OtagoNet as its revenue increased significantly faster than that of other suppliers and would reduce the legibility of the chart if all suppliers were shown on the same scale.

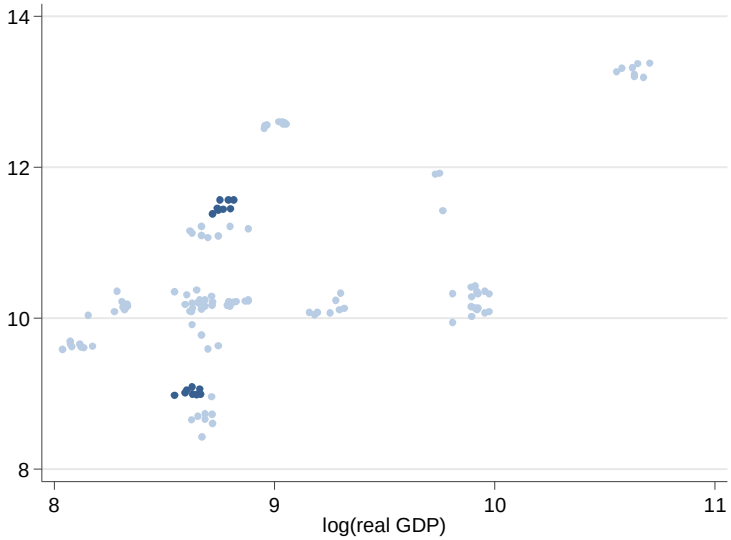
Chart G.2 OtagoNet's Line charge revenue and regional GDP



Note: For readability the graph does not start at zero.

G34. The scatter diagram below illustrates the positive relationship between the log of line charge revenue and log of GDP for each supplier. The separate clusters of data points broadly correspond to the revenue/GDP data pairs for a given supplier.

Chart G.3 Relationship between the total line charge revenue and real GDP, 2003/04-2010/11



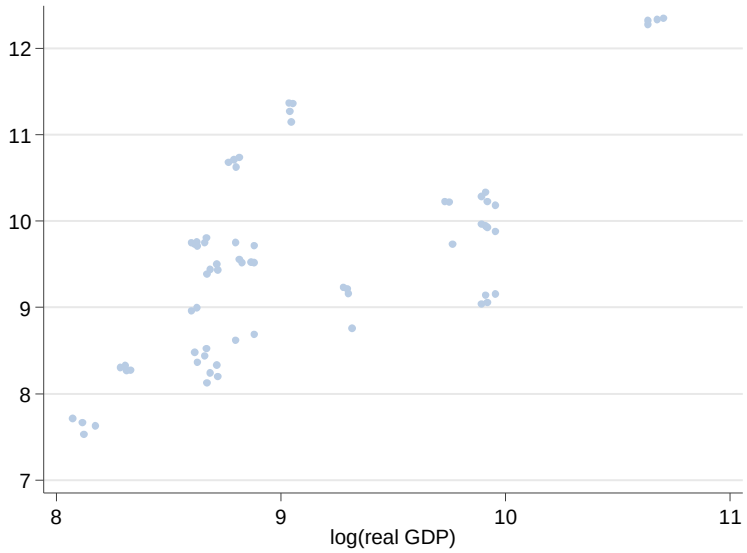
Note: For readability the graph does not start at zero.

G35. The chart shows that most of the variation in revenue and GDP is between suppliers rather than for a given supplier over time. 'Within variation' of the revenue-GDP combinations of a given supplier over time is lower.

G36. For example, the dots in darker blue represent the data points of two suppliers. The variation within a set of points is the within variation for a given supplier. The difference between the two suppliers is an example of the between variation between different suppliers across the time period.

G37. Chart G.4 below shows the line chart revenue from industrial and commercial users plotted against GDP.

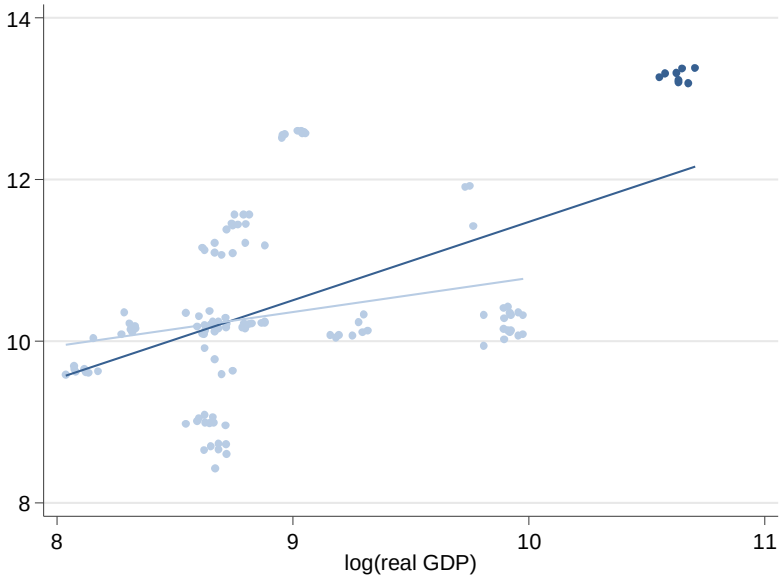
Chart G.4 Relationship between the revenue from industrial and commercial users, and real GDP, 2007/08-2010/11



Note: For readability the graph does not start at zero.

G38. As we further discuss below when we undertook statistical testing of our models we identified that Vector had a significant impact on most models' estimates. Chart G.5 overleaf graphically illustrates the influence by fitting lines of best fit to the scatter plot. Vector's data points are shown to the right of the chart in darker blue and the fitted line including Vector is also dark blue.

Chart G.5 The effect of Vector on the line of best fit to GDP—revenue scatterplot, 2003/04 to 2010/11



Note: For readability the graph does not start at zero. These lines are not the fitted values from the econometric analysis and are simply shown to illustrate the impact of Vector on the fitted in the scatterplot.

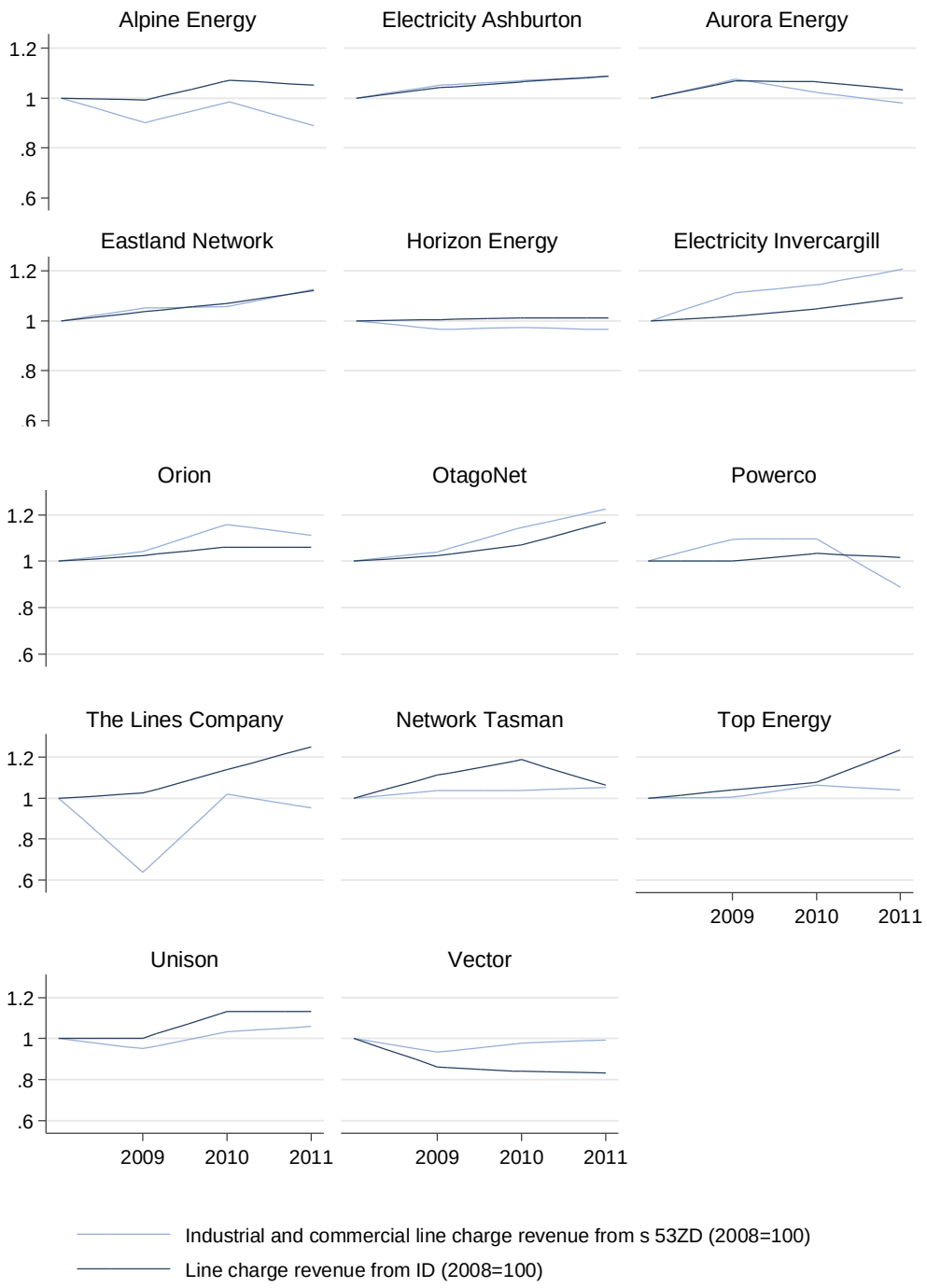
Comparing our two measures of revenue

G39. We can find out how good a proxy total line charge revenue is for line charge revenue from industrial and commercial users by comparing the information disclosure data to that from s 53ZD information request. While there is only an overlap of four years it seems reasonable to assume that any relationship observed also holds in previous years.

G40. Chart G.6 overleaf shows that the relationship between 53ZD revenue and ID revenue for most suppliers is close. For some suppliers the movement in 53ZD is quite large, but we do not know whether these are actual changes in revenue from industrial and commercial users, or whether these are issues with the data. We have plotted Centralines and Nelson Electricity separately to improve the readability of the other charts.

G41. Overall, we consider that ID revenue is a suitable proxy for revenue from industrial and commercial users.

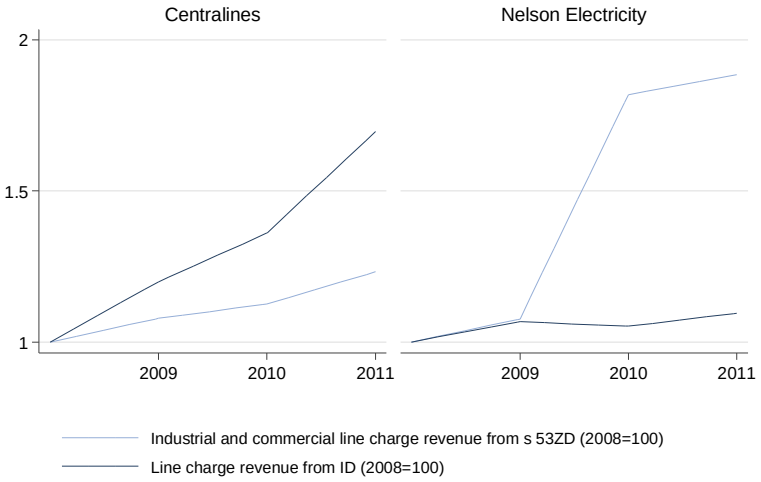
Chart G.6 Relationship between ID revenue and 53ZD total revenue, 2008/09-2010/11



Note: Wellington not shown as only has data from 2008/09 to 2010/11. For readability the graphs do not start at zero.

Source: Commission analysis.

Chart G.7 Relationship between ID revenue and 53ZD total revenue for Centralines and Nelson Electricity, 2008-2011



Discussion of the results of our modelling

G42. This section presents the results for our modelling. In summary:

G42.1 We were able to identify the most robust models using the ID revenue variable. The diagnostic testing of the models using s 53ZD revenue is inconclusive. We consider the s 53ZD data models useful as cross check;

G42.2 Our preferred model estimates that a 1% increase in real GDP is associated with a 0.52% in revenue. Using alternative model specifications resulted in a range of estimates between 0.5 and 0.67. Some of these estimates are statistically robust results, others are not; and

G42.3 We identified some data points from Vector, OtagoNet and Aurora that that had influenced the statistical robustness of the results and we excluded these from the estimation. As discussed above, we also excluded Orion in 2010/11 and Wellington Network from the estimation.

Results of modelling revenue from information disclosures

G43. Table G.2 overleaf summarises results of modelling revenue from information disclosures.

Table G.2 ID revenue econometric modelling results

Item	Pooled model	Fixed effects model		Between effects model		Random effects model	
		Cross-sections	Time	Cross-sections	Time	Cross-sections	Time
lngdp	0.64***	0.50***	0.64***	0.67	0.59*	0.52***	0.64***
const	4.60**	5.83***	4.60***	4.33	5.07	5.71***	4.60***
R^2	0.12	0.12	0.12	0.12	0.12	0.12	0.12
F	14.60***	9.95**	22.36***	1.77	3.95	14.73***	24.02***
rho		0.99				0.99	0
N	103	103	103	103	103	103	103

Notes: *** significant at 1% confidence level; **significant at 5% confidence level; * significant at 10% confidence level
Note that the R^2 should not be compared between models with a different number of observations.
Source: Commission analysis

G44. The signs of the estimated coefficient of the relationship between GDP and revenue confirm the findings in the exploratory analysis that the relationship is positive. The estimates are in the range of 0.5 to 0.67. As the variables are measured in logs they can be interpreted as elasticity, eg, the pooled model indicates that a 1% change in GDP is related to a 0.64% change in revenue.

G45. The estimated relationships are statistically significant (based on the F-statistics) in all models except for the between effects models.[163] We therefore cannot rely on the model specifications for between effects model for time effects.

G46. Our testing indicates that the most robust models are the random effects model for cross-sections of suppliers and time effects, ie, 0.52 (cross-sections) and 0.64 (time effects). These models have been chosen based on the results of a number of statistical tests further discussed below.

G47. On balance, our preferred model is the random effects model for cross-sections of model with a coefficient of 0.52. The statistical tests we used to identify the preferred model are discussed below.

G48. A key assumption for the estimates to be unbiased is that the error needs to be random and uncorrelated with the explanatory variable. There is no evidence that this was an issue with our preferred model.

[163] Note that the rho values indicate that 99% of the variance is due to difference across suppliers.

G49. The random effects models for cross-sections of suppliers assumes that there is unobserved individual heterogeneity between suppliers. As illustrated in the scatter plots most of the variation is between suppliers, ie, cross-sectional, rather than over time.

Removal of influential data points from our modelling

G50. As part of our modelling, we visually explored the data and ran formal statistical tests that examine the influence of individual observations on the model coefficients.[164] Table G.3 below summarises the observations we excluded, and the reasons for it.

Table G.3 Observations we excluded from our modelling

Supplier	Year	Comment
Orion network	2010/11	No data is available for the Orion network in 2011 due to the Canterbury earthquakes.
Wellington	2008/09 to 2010/11	The 2008/09 value could be affected by sale by Vector; we also considered dropping years 2009/10 and 2010/11 due to a lack in observations for this network.
Vector	2003/04 to 2010/11	Based on the results of the statistical outlier tests. Three of the four outlier tests indicated that Vector is a statistical outlier.
Aurora Energy	2003/04 to 2010/11	Our exploratory shows that the data is unusual and excluding Aurora improved the robustness of the model.
OtagoNet	2003/04 to 2010/11	Our exploratory shows that the data is unusual for OtagoNet and excluding it improved the robustness of the model.

Source: Commission analysis

G51. One question to consider is whether excluding the above suppliers means that they are so different that our estimated coefficients should not be used for modelling their constant price revenue. We consider that it is appropriate to generalise our estimate to the excluded suppliers. First, the reason may be data issues. Second, in particular for Vector, the likely reason why it has a large effect on the models is the result of its size relative to the rest of the industry. Our models are not flexible enough to cope with the resulting wide range in the revenue dependent variable. Ultimately we do not consider that these suppliers are likely to have a very different revenue–GDP relationship to the rest of the industry.

[164] See footnote 46 in Attachment D for a discussion of the statistical outlier tests we used.

G52. When Vector is included in the modelling the spread of the estimates is wider, ranging from 0.49 to 1.06. However, in our preferred model specification the parameter estimate is very similar, increasing from 0.52 to 0.56.

Discussion of diagnostic testing

G53. Table G.4 below summarises the different diagnostic tests we did to identify our preferred model.

Table G.4 Results of diagnostic tests

Purpose	Statistic	p- value	Result
Test on poolability (cross-sections)	19315.07	0.00	Reject the null hypothesis of poolability. This does not imply that we should run individual regressions for every supplier. Fixed or random effects may be valid
Test on poolability (time effects)	0.07	1.00	Fail to reject null hypothesis of poolability. We can, therefore, pool the data across time
Fixed effects (cross-sections)	1632.66	0.00	Reject the null hypothesis of no individual effects. Cross-sectional effects are, therefore, valid and suppliers are heterogeneous
Fixed -effects (time)	1.09	0.38	Fail to reject null hypothesis time effects. Therefore, no time effects are required
Fixed vs random effects (cross-section)	0.03	0.86	The random effects model is the preferred model
Fixed vs random effects (time)	0.00	0.99	The random effects model is the preferred model
LM on random effect (cross-sections)	351.12	0.00	Reject the null hypothesis. Therefore, random effects across suppliers are appropriate rather than a pooled model
LM on random effect (time)	4.25	0.04	Reject the null hypothesis. Therefore, random effects across suppliers are appropriate rather than a pooled model

Source: Commission analysis

G54. We interpreted these results as follows.

G54.1 The null hypothesis of poolability across cross-sections of suppliers is rejected.[165] Fixed or random effects may also be valid, which we tested and discuss further below.

G54.2 We do not reject the poolability test across time. Therefore, a model that pools suppliers across time may be appropriate.

G54.3 Testing the fixed effects models indicates that there are no statistically significant time effects. However, the test shows that individual effects are valid as suppliers are heterogeneous.

G54.4 The Hausman test is used to determine whether we should specify a fixed or a random effects model. This test indicated that the random effects model is appropriate (for both time effects and cross-sections of suppliers).

G54.5 The LM test indicates that the cross-sectional effect is most statistically significant compared to the time effects model.

G54.6 Based on this testing and intuition discussed above, our preferred model is the random effects model (cross-sections of suppliers).

Results of modelling revenue from section 53ZD information request

G55. As discussed above, the s 53ZD data has the advantage that it is more closely related to the revenue concept that we wish to model, but it is available for a shorter time period.

G56. The table overleaf summarises results of modelling revenue from information disclosures.

[165] A. Vaona, "Stata tip: A quick trick to perform a Roy-Zellnet test for poolability in Stata" available at http://doc.rero.ch/lm.php?url=1000,42,6,20080417092244-DQ/wp0804.pdf

Table G.5 Section 53ZD revenue econometric modelling results

Item	Pooled model	Fixed effects model		Between effects model		Random effects model	
		Cross-sections	Time	Cross-sections	Time	Cross-sections	Time
lngdp	0.83***	0.10	0.83***	0.85**	2.14	0.54**	0.83***
const	1.86	8.46	1.87	1.63	-9.9	4.48	1.85
R^2	0.23	0.23	0.23	0.23	0.23	0.23	0.23
F	16.53***	0.06	24.89***	4.64	2.08	6.64**	26.33***
rho		0.99	0.01			0.98	0
N	57	57	57	57	57	57	57

Notes: *** significant at 1% confidence level; ** significant at 5% confidence level
Similar to the modelling using ID data, we excluded the Vector network and the Aurora network because it had a disproportionate influence on the results. Note that the R^2 should not be compared between models with a different number of observations
Source: Commission analysis

G57. The relationship between GDP and revenue is positive but there is wide range of coefficient estimates with some of them not statistically significant or economically unintuitive. As an aside, we note that the random effects (cross-sections) estimate of 0.54 is close to our preferred model (0.52).

G58. Although our diagnostic testing did not indicate serious statistical problems with the model, we prefer the models based on ID revenue which includes more data points. We conducted the same diagnostic tests used for models based on ID revenue.

G59. The results for the diagnostic tests can be tentatively interpreted as suggesting that the most robust model is the pooled model. We have reservations on the validity of this finding based on the low power of the diagnostic tests in a small sample.

Limitations of our modelling

G60. Like all economic models our modelling has some shortcomings.

G60.1 The number of data points is somewhat limited (naturally constrained by the size of the industry), in particular in the modelling using s53ZD data. This has had an impact on the model specifications we have been able model (eg we have limited ourselves to static models and have not allowed for the possibility that GDP may affect revenue with a lag).

G60.2 We have not included other explanatory factors in the modelling. Given that the objective is to estimate specific parameters rather than a model that fully describes revenue and the strong relationship between GDP and revenue, the

absence of those variables does not seem a shortcoming for purposes of this analysis.

G60.3 There are some data issues, as discussed above.

Peer review of our modelling

G61. Professor Jeff Borland has peer reviewed our econometric modelling. His report is published alongside this paper.[166] Table G.6 below summarises his recommendations and the action we have taken in response.

Table G.6 Response to recommendations of peer review

Recommendation by Jeff Borland	Our response
Provide reasons why the sample periods used are valid	We discuss why the sample periods are valid as discussed in paragraphs G15-G17
Motivate analysis with presentation of some descriptive statistics	We included a section on descriptive statistics in paragraphs G29-G41
Expand explanation of some aspects of econometric modelling	We discuss the use of only non-exempt suppliers in paragraphs G21, the specification of the dependent variable in paras G15-G28, and the models in paragraphs G5-G14
Include a discussion of how the preferred models are chosen from amongst alternative specifications	We discuss how we use the diagnostic tests to chose our preferred model in paragraph 53
Have consistent analysis and presentation of results between modelling revenue and opex	We present the results for opex and revenue consistently
Consider Zellner-Roy test for poolability as an alternative to Chow test	We changed the poolability test from a Chow test to Zellner-Roy test. The outcome of the two tests was the same
Expand explanation of analysis using alternative definitions of revenue	We discuss why we have used alternative revenue definitions in paragraphs G15to G28 and G39-41
Consider whether weighted or unweighted model is appropriate	We discuss why an unweighted model is appropriate in paragraph G14
Test for the influence of statistical outliers	We undertook exploratory analysis and formal statistical testing, as discussed in paragraphs G50-52

[166] Jeff Borland is a Professor in the Department of Economics at the University of Melbourne.

Attachment H: Other information for constant price revenue forecast

Purpose of this attachment

H1. Our modelling of constant price revenue uses a range of data inputs and the purpose of this attachment is to explain how we developed:

H1.1 Population forecasts for each supplier;

H1.2 GDP forecasts for each supplier;

H1.3 Revenue weights for each supplier; and

H1.4 An industry wide trend in energy intensity of household users.

H2. For additional technical information refer to the spreadsheet which is published on our website alongside this report.[167]

Our approach to developing population forecasts for each supplier

H3. To develop population forecasts for each supplier we match population forecasts from New Zealand Statistics by Territorial Local Authority (TLA) to the area covered by each supplier's network.

H4. Table H.1 below shows the data and sources that we used to estimate population forecasts for each supplier.

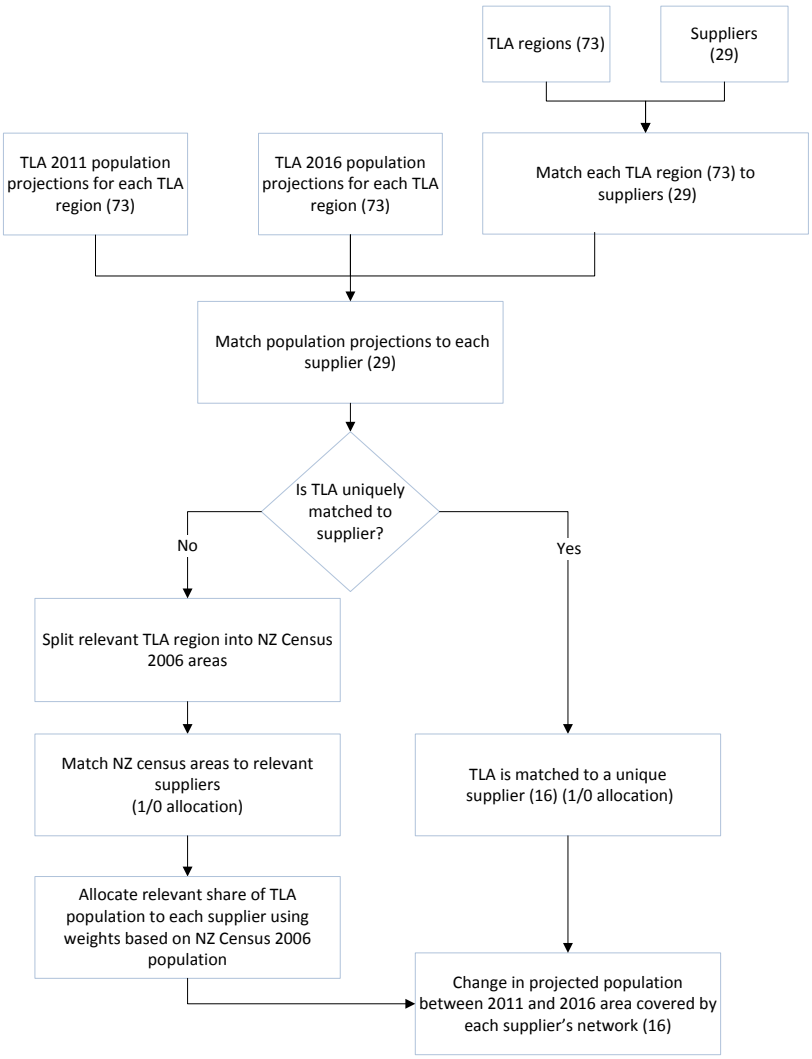
Table H.1 Information for estimating population forecasts for each supplier

Information used	Source
TLA population forecasts for 2011 and 2016	Statistics New Zealand, sub-national population projections tables, 2006-2031 www.stats.govt.nz/tools_and_services/tools/tablebuilder/population-projections-tables.aspx
Population by Census 2006 areas	Statistics New Zealand, Census 2006, Regional quick statistics http://stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace.aspx
Supplier boundaries corresponding to TLAs	Critchlow Ltd and supplier's websites

[167] Under commercial terms between the Commission and NZIER, and the Commission and Critchlow Ltd, the information on regional GDP and the relationship between TLAs and suppliers may be shared with the industry, but not more widely. Suppliers may request this information directly from the Commission.

H5. The figure below sets out the process we followed to estimate population forecasts for the area covered by each supplier's network based on population forecasts by Statistics New Zealand. This process identifies which of the 73 TLA population forecasts (central forecasts) correspond to each supplier.[168]

Figure H.1 Process for developing population forecasts for each supplier



H6. In summary:

H6.1 Forecasts of population (central forecasts) for 2011 and 2016 for each TLA region are taken from Statistics New Zealand data.

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168 The use of Territorial Local Authority population projections to make information more supplier-specific was proposed in submissions. PwC, "Submission to the Commerce Commission on 2010-15 Default Price-Quality Path for Electricity Distribution Businesses Draft Decisions Paper" 24 August 2011, p9.

H6.2 Forecasts for each TLA are then assigned to a supplier. If a TLA region is uniquely matched to a single supplier, the populations are matched to that supplier.[169]

H6.3 In the event that a TLA region is not unique to one supplier an extra step is taken. This involves allocating a proportion of the TLA population forecast to a supplier. The allocation is based on splitting the TLA region further into areas as per New Zealand 2006 census and calculating weights using New Zealand 2006 population counts (from 2006) assigned to the relevant supplier.

H6.4 Based on the population forecasts for 2011 and 2016 for each supplier we then calculated the annualised projected population growth over the regulatory period. We assumed that the growth from 2009/10 to 2010/11 is the same as for the years 2010/11 to 2015/16.

H7. Table H.2 overleaf summarises the TLA regions that are allocated to each supplier. The number in brackets indicates the proportion of the TLA population allocated to the supplier where it is less than one.

[169] Note that we start the matching process with the full set of 29 suppliers even though we are only interested in projections for the 16 non-exempt suppliers. Starting with a full set of suppliers ensures that where a TLA corresponds to both exempt and non-exempt suppliers we can achieve a correct match.

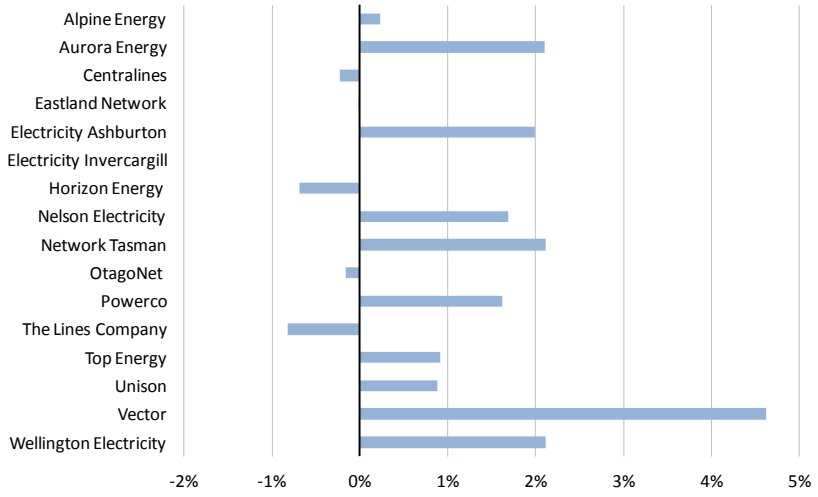
Table H.2 Summary of Territorial Local Authorities matched to each supplier

Supplier	Matched Territorial Local Authorities
Alpine Energy	Timaru, MacKenzie, Waimate
Aurora Energy	Dunedin, Central Otago (0.89), Queenstown-Lakes
Centralines	Central Hawkes Bay
Eastland Network	Gisborne, Wairoa
Electricity Ashburton	Ashburton
Electricity Invercargill	Invercargill
Horizon Energy	Whakatane, Kawarau, Opotiki
Nelson Electricity	Nelson
Network Tasman	Tasman
OtagoNet	Clutha, Waitaki (0.08), Central Otago (0.11)
Powerco	Tauranga, Matamata-Piako, South Waikato, Western Bay of Plenty, Stratford, New Plymouth, South Taranaki, Ruapehu (0.28), Wanganui, Rangatikei, Manawatu, Palmerston North, Masterton, Tararua (0.26), Carterton, South Wairarapa
The Lines Company	Otorohanga, Taupo (0.20), Waitomo
Top Energy	Far North
Unison	Rotorua, Taupo (0.80), Napier, Hastings
Vector	Auckland, Rodney, North Shore, Waitakere, Papakura (0.5), Manakau
Wellington Electricity	Wellington, Lower Hutt, Upper Hutt, Porirua

Notes: TLA is allocated 1/0 unless otherwise stated by brackets. Papakura is assumed to be split evenly between Vector and Counties Power (an exempt supplier).

H8. Chart H.1 overleaf shows the cumulative population forecast for each supplier between 2012/13 and 2014/15.

Chart H.1: Projected annual population growth for each supplier (cumulative growth 2012/13 to 2014/15)



Our approach to developing GDP forecasts for each supplier

H9. To develop GDP forecasts for each supplier we matched regional real GDP from NZIER to the area covered by each supplier's network.

H10. Table H.3 below shows the data and its sources we used to develop GDP forecasts for each supplier.

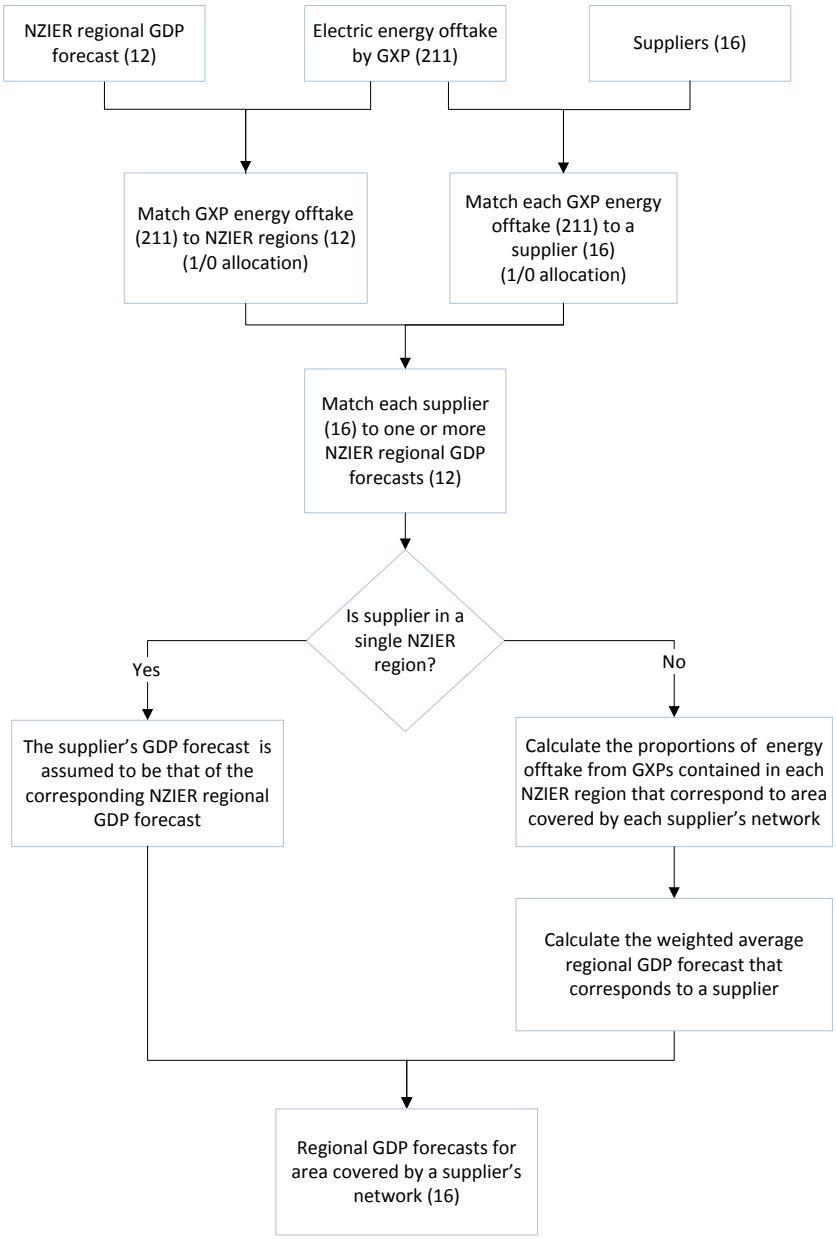
Table H.3 Information for estimating GDP forecasts for each supplier

Information used	Source
Electric energy offtake by Grid Exit Point	Electricity Authority 2011 centralised dataset
Regional GDP actual (2011) and forecasts (2012 to 2015)	NZIER Quarterly Predictions, July 2012

H11. The figure below sets out the process we used for estimating GDP growth for each supplier.[170] This process matches 12 forecasts of regional GDP to each of the 16 suppliers.

[170] Not that GXP STK0331 falls within Network Tasman's boundary but is shared with Nelson Electricity. As both fall with the Upper South Island NZIER region both suppliers were assigned the same population growth.

Figure H.2 Process for estimating GDP growth for each supplier's operational regional



H12. In summary:

H12.1 We started by allocating energy offtake at each GXP (as per centralised dataset) to an NZIER region and the area covered by each supplier's network. Given the relationship between electricity volumes and GDP, we consider total electricity demand to be a reasonable weighting factor to tailor the 12 regional GDP forecasts more closely to suppliers' areas.

H12.2 The suppliers are then matched to one or more NZIER regions. If the entire supplier's GXP off-take falls within a unique NZIER region, the forecast growth over the regulatory period is matched to GDP growth as projected by NZIER.

H12.3 If the supplier's GXPs are located in multiple NZIER regions we calculate the proportion of that supplier's energy off-take that falls within each NZIER region. The weighted average forecast GDP growth is then calculated and assigned to the corresponding supplier for the regulatory period.

H13. Table H.4 below summarises the NZIER regions that are allocated to each supplier. The number in brackets indicates the proportion of GDP of that NZIER region which is allocated to that supplier. (As discussed above, this proportion is the energy off-take from GXPs contained in each NZIER region that corresponds to a given supplier.)

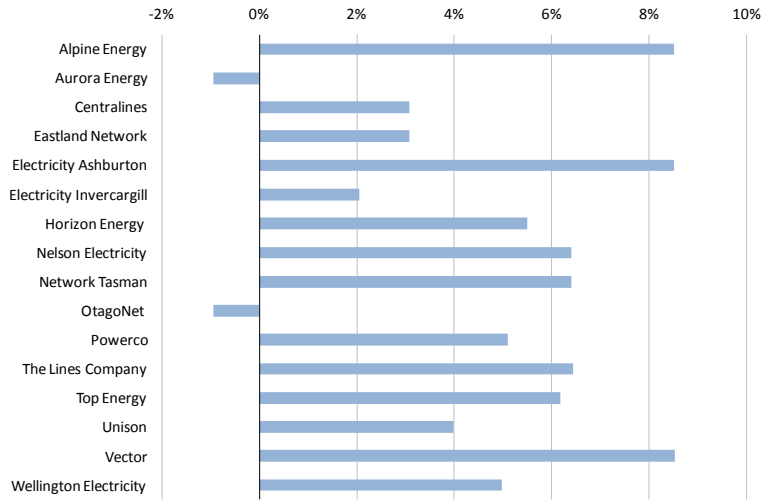
Table H.4 Summary of NZIER regions matched with each supplier

Supplier	NZIER region allocation
Alpine Energy	Canterbury (1)
Aurora Energy	Otago (1)
Centralines	Gisborne-Hawkes Bay (1)
Eastland Network	Gisborne-Hawkes Bay (1)
Electricity Ashburton	Canterbury (1)
Electricity Invercargill	Southland (1)
Horizon Energy	Bay of Plenty (1)
OtagoNet	Otago (1)
Nelson Electricity	Upper South Island (1)
Network Tasman	Upper South Island (1)
Powerco	Waikato (0.27), Bay of Plenty (0.21), Taranaki (0.19), Manawatu-Wanganui (0.26), Wellington (0.07)
The Lines Company	Waikato (0.73), Manawatu-Wanganui (0.27)
Top Energy	Northland (1)
Unison	Gisborne-Hawkes Bay (0.65), Bay of Plenty (0.30), Waikato (0.05)
Vector	Auckland (1)
Wellington Electricity	Wellington (1)

H14. The figure below shows the estimated cumulative GDP forecast for each supplier between 2012/13 to 2014/15.[171]

[171] The modelling uses annual GDP forecasts rather than the annualised figures. Suppliers may obtain these from the Commission on request.

Chart H.2: Forecast of GDP growth for each supplier (cumulative growth 2012/13 to 2014/5)



Proportion of line charge revenue from residential users

H15. Our modelling of constant price revenue relies on information from suppliers on the proportion of revenue from different types of users, in particular residential, commercial and industrial users.

H16. We wanted to understand whether suppliers have access to relevant information and whether using an approach based on modelling by type of user was possible. We therefore asked suppliers to provide information under a section 53ZD information request. Most suppliers could provide this information and we have proposed an approach that relies on modelling of constant price revenue by type of users.

H17. All suppliers were able to this information, although some suppliers provided caveats on the quality of information. We gave significant flexibility to suppliers on how they provided this information to suit their information systems and billing practices. Some suppliers provided information further broken down, for example into commercial users and industrial users. Since not all suppliers provide this information we could not test modelling at a lower level of disaggregation.

H18. Table H.5 overleaf sets out how we grouped the information that suppliers provided to us into ‘residential users’, and ‘industrial and commercial user’ categories.

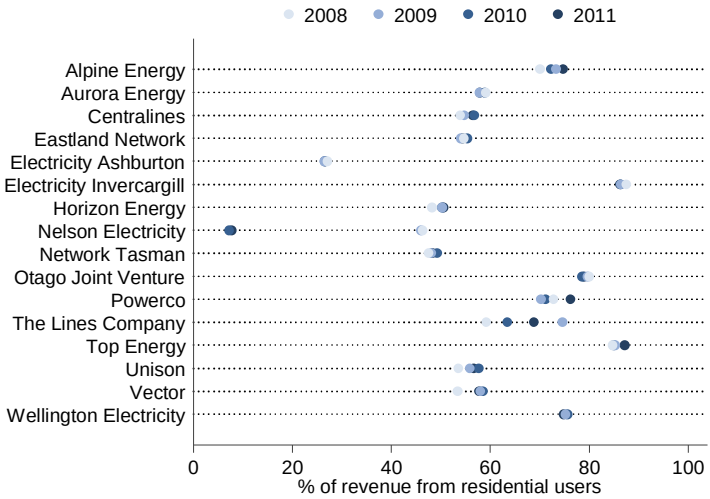
Table H.5 Summary of NZIER regions matched with each supplier

Supplier	Residential users	Industrial and commercial users
Alpine Energy	Household	Other User
Aurora Energy	Household	Commercial, Industrial
Centralines	Household	Commercial, Industrial
Eastland Network	Household	Commercial, Industrial
Electricity Ashburton	Small	Medium, Large
Electricity Invercargill	Household	Commercial
Horizon Energy	Household	Commercial, Industrial
OtagoNet	Household	Commercial, Industrial
Nelson Electricity	Small Connection	Medium Connection, Large Connection including Top 5
Network Tasman	Household	Small Commercial, Commercial, Industrial, Large Industrial
Powerco	Household	Commercial, Industrial
The Lines Company	Small Connection <25 kVA	Medium Connection between 25kVA and 70 kVA, Large Connection over 70 kVA
Top Energy	Household	Commercial, Industrial
Unison	Household	Commercial, Industrial
Vector	Household	Commercial, Industrial
Wellington Electricity	Household	Commercial, Industrial

H19. Based on the information provided by suppliers, the figure below shows the percentage of line charge revenue from residential users. Suppliers provided information for 2007/08 to 2010/11. We used suppliers' 2010/11 values in the modelling, except for Nelson where we used the average of the ratios for 2007/08 and 2008/09.[172]

[172] Nelson Electricity told us that due to changes in methodology applying line charges to the mass market in 2009/10, its ability to accurately identify revenue from residential users has reduced.

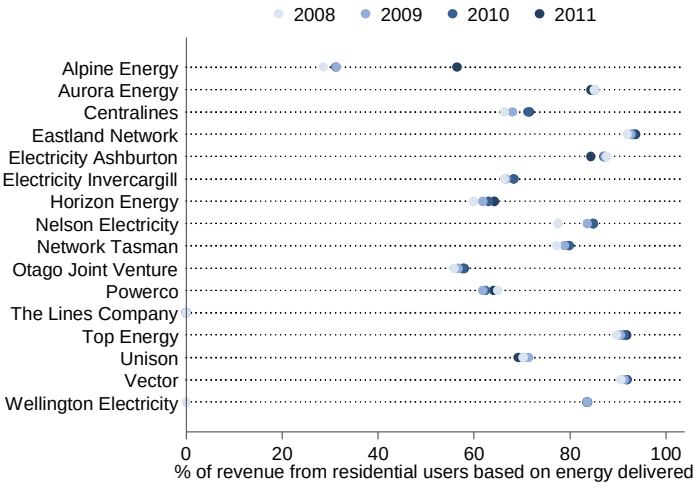
Chart H.3 Percentage of line charge revenue from residential users



Percentage of residential line charge revenue based on energy delivered

H20. Chart H.4 below shows the percentage of residential line charge revenue from a charge based on energy delivered. For most suppliers this ratio is similar over the period. We used suppliers' 2010/11 values in the modelling.

Chart H.4 Percentage of residential line charge revenue from a charge based on energy delivered



Note: The Lines Company reported that none of its revenue from households is from charges based on energy delivered.

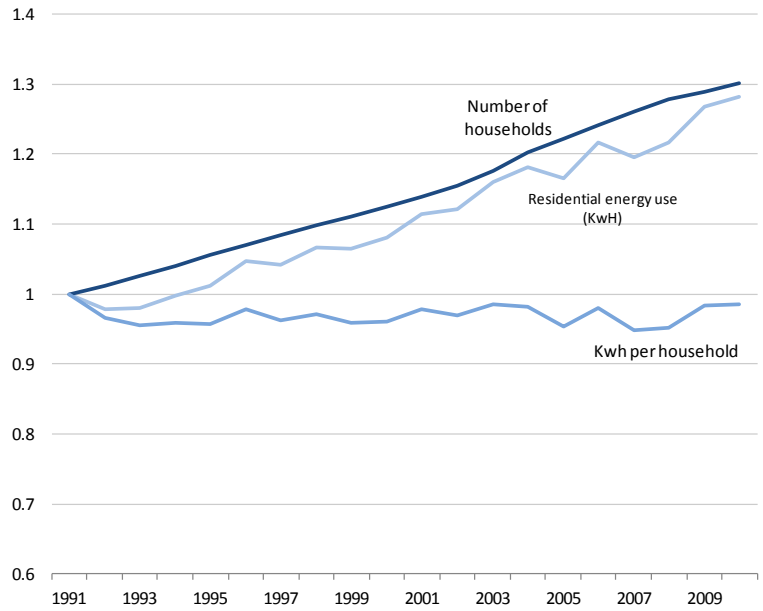
Analysis of energy intensity of residential users

H21. Our modelling of constant price revenue assumes no change in the energy use per residential user.

H22. Our decision is based on an assessment of trends in energy use per household since 1991 using information from the Ministry of Business, Innovation and Employment.

H23. Chart H.5 below shows the trend in the number of households, residential energy use and energy use per household.

Chart H.5 Trends in the number of households, residential energy use and energy use per household (1991=1)



H24. We also calculate the trend growth and the log growth over a different time periods. Under both measures each supplier's growth was close to zero, so we consider an assumption of zero percent growth reasonable.

Attachment I: Timing assumptions used to reach draft decisions

Purpose of this attachment

I1. This attachment explains the timing assumptions used to calculate present values when determining starting prices. It also refers to proposed amendments to the customised price-quality path input methodologies.[173]

Our assumptions improve the accuracy of our modelling

I2. Timing assumptions are required to recognise that suppliers incur and receive cash flows continuously throughout the year. These assumptions are reflected in the 'timing factors' we have included in the formula used to calculate the revenue each supplier should be allowed to recover based on our estimate of their building block costs.

I3. To improve the accuracy of our modelling, we have assumed that:

I3.1 Opex is incurred mid-year, on average. We have assumed that opex is spread throughout the year at regular intervals, so the same amount is paid in the first and second half of the year. This is equal in net present value terms to all costs being incurred mid-year;

I3.2 Capex is commissioned mid-year, on average. This reflects an assumption that assets are commissioned evenly throughout the year. We have made this assumption because the seasonal trends cannot be reliably forecast;

I3.3 Tax costs are incurred mid-year, on average. We have made this assumption for the purposes of simplicity. In reality tax should be able to be paid at the provisional tax dates, which average out to later than mid-year. Mid-year timing is, therefore, favourable to suppliers because they are able to make payments, on average, later than the mid-year assumption;

I3.4 Revenue is received on 3 November, on average. Revenues from lines charges are expected to be received on the 20th of the following month. Assuming that revenues are received in equal increments throughout the year is equivalent to assuming that all revenues are received slightly later than mid-year on average, ie, on 3 November rather than 31 September; and

I3.5 Other income is received mid-year, on average. This assumption is made for simplicity, because seasonality cannot be reliably forecast.

I4. We note that Powerco agreed that these assumptions will tend to more accurately reflect each supplier's cash flows.[174]

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[173] Commerce Commission "Consultation on Proposed Amendments to Input Methodologies: Cashflow timing for Customised Price-Quality Paths" (10 August 2012)

Addressing inconsistencies with timing assumptions used elsewhere

I5. We are currently consulting on an amendment to the timing assumptions used in the input methodologies for customised price-quality paths, and on similar timing assumptions for information disclosure regulation.[175] The proposed amendments for customised price-quality paths adopt similar intra-year timing assumptions to those used in this paper for default price-quality paths.[176] The proposed amendment would address submitter's concerns of inconsistencies between the two types of paths.

I6. Submitters have also raised a concern that the intra-year timing assumptions add an additional level of complexity.[177] We do not agree that the proposed timing assumptions are a barrier to implementing the approach at low cost, and any complexity does not outweigh the benefit of more accurate modelling.

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174 PricewaterhouseCoopers "Additional Input Methodologies for Default Price-Quality Paths: Process and Issues Paper" (report prepared for Powerco, 26 January 2012)

175 Commerce Commission "Consultation on Proposed Amendments to Input Methodologies: Cashflow timing for Customised Price-Quality Paths" (10 August 2012); Commerce Commission "Draft Commerce Act (Electricity Distribution Services Information Disclosure) Determination 2012" (6 July 2012).

176 Under a customised price-quality path timing assumptions for commissioned and disposed assets are more accurately calculated to better meet supplier's individual circumstances.

177 For example, Vector, Submission to Commerce Commission on Draft Decision on Starting Price Adjustments for Electricity Distribution Businesses, 24 August 2011, page 16.

Attachment J: Why we have not included any additional allowances

J1. This attachment provides further information about why we do not propose to include an additional allowance for suppliers if the default price-quality path is reset.

How we calculate the potential additional allowance

J2. Before we explain why an additional allowance is unlikely to be appropriate for any suppliers for the proposed reset, we begin by setting out a framework in which an additional allowance could be calculated. This framework is based on assessing the two impacts introduced towards the end of Chapter 5.

An additional allowance has two impacts on consumers

J3. As noted in Chapter 5, an additional allowance for suppliers would have two impacts on consumers:

J3.1 An additional allowance for the supplier would reduce the probability that a customised price-quality path will be proposed, so the expected costs to consumers of a proposal would be reduced; and

J3.2 If the supplier does not propose a customised price-quality path, then the additional allowance for the supplier would mean that consumers face higher prices under the default price-quality path.

J4. Where the first impact is greater than the second impact, an upward adjustment to prices allowed under the default price-quality path is in principle cost-effective for both suppliers and consumers.

J5. To estimate what the appropriate adjustment would be, we have set up a simple mathematical model. This model measures the impacts with reference to the expected costs of a customised price-quality path, which are adjusted to reflect the probability of a proposal, and the expected additional costs to consumers under the default price-quality path, if an additional allowance is included.

J6. By minimising the total cost to consumers in respect of an additional allowance for suppliers, we can find under what circumstances an adjustment is beneficial to consumers and what the optimal adjustment would be.

The impact on the probability of a proposal depends on the margin of error in our forecasts

J7. The margin of error in our forecasts determines the likely impact that introducing an additional allowance would have on the probability that the supplier will make a proposal. For example:

J7.1 If our forecast has a relatively large margin of error, then an additional allowance of $1m (say) would be unlikely to have much of an impact on the likelihood that a supplier will make a customised proposal; and

J7.2 If our forecast has a relatively small margin of error, then an additional allowance of $1m (say) might significantly reduce the likelihood that the supplier will make a customised proposal.

J8. An additional allowance would be unlikely to benefit consumers in the first of these two examples, whereas in the second, an additional allowance may be beneficial.

Simplifications help to understand reality—the impact of relaxing them matters

J9. Our model relies on some simplifying assumptions to help us understand the realities of when consumers will benefit from an additional allowance. However, we recognise that simplifying assumptions mean that the model will not reflect reality perfectly. We therefore consider the impact of relaxing our assumptions after setting out the simplified framework up front.

The probability of a supplier proposing a customised price-quality path

J10. We link the probability of suppliers proposing a customised price-quality path to the likelihood of them accepting or rejecting the total net revenue of a default price-quality path. In other words, where revenue is less than a particular amount, we expect that a supplier will propose a customised price-quality path.

J11. Revenue greater or less than the supplier requires before they propose a customised price-quality path can be analysed as a margin of error.[178] Our first simplification is that the margin of error is uniformly distributed. This means all possible actual outcomes are equally likely to occur.

J12. If the distribution of the error term is symmetric, then the margin of error will have an equal spread in either direction. This means that, on average, a supplier's default price-quality path would be accepted, and the probability any individual supplier will propose a customised price-quality path is 0.5, ie, half of suppliers will propose a customised price-quality path. Later, we consider the impact of relaxing this assumption with a more realistic view.

J13. These simplifying assumptions can be expressed in terms of a margin of error, R:

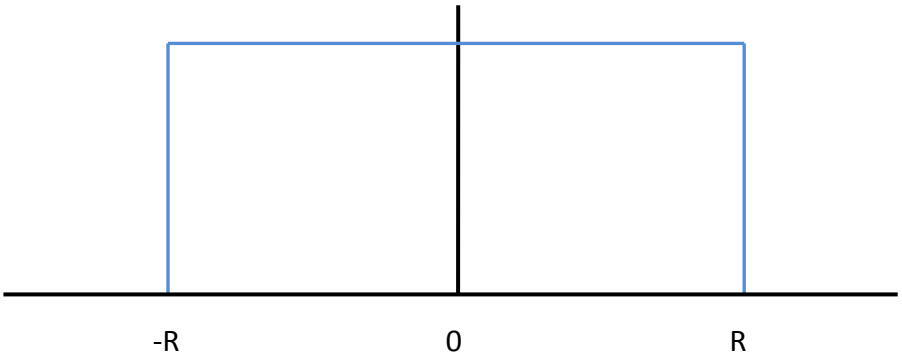
J13.1 Where R is negative, a supplier will propose a customised price-quality path.

J13.2 Where R is positive a supplier will not propose a customised price-quality path, and the supplier will be likely to be receiving revenue under the default price-quality path that exceeds their requirements.

J14. R is the spread from no error (the point at which revenue is just sufficient so that a supplier will accept the default price-quality path). These assumptions are illustrated in the probability density function overleaf.

[178] We use the word error in its statistical sense.

Figure F.1 Uniform probability density function for error



Cumulative probability of a supplier proposing a customised price-quality path

J15. We can express the probability of a supplier proposing a customised price-quality path in terms of cumulative probability.[179] This tells us what the overall probability of a supplier proposing a customised price-quality path is, and how this overall probability may change if we include an additional allowance when we set the default price-quality path.

J16. The cumulative probability function for this uniform distribution is:[180]

Equation 1

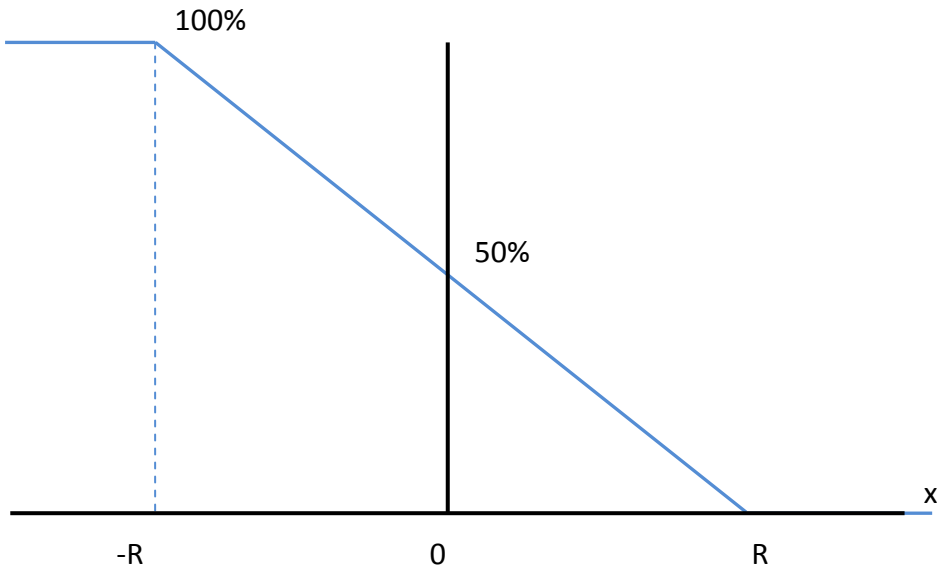
$$F(x) = \frac{-x + R}{2.R}$$

J17. The additional allowance is the term 'x' and we can see that, where x is set at zero and R is symmetric, the probability of a customised price-quality path is 0.5. This relationship is illustrated in figure 2 below.

[179] The difference between a probability and the cumulative probability is a probability gives the chances of a specific outcome occurring (for example that the DPP is precisely correct). A cumulative probability gives the chances of an outcome at or less of a specific outcome occurring (for example that the DPP is below the value which would prompt acceptance). For our purposes it is the cumulative probability that is important.

[180] This is the cumulative probability function for a simplified uniform distribution given our expected value of zero and symmetry in the margin of error.

Figure F.2 Cumulative Probability of a supplier proposing a customised price-quality path with respect to an additional allowance 'x'



J18. If the additional allowance to the default price-quality path is set at the margin of error (R) then there is no possibility of a supplier proposing a customised price-quality path. Total revenue will always be at least sufficient, so at this point F(x) = 0. Equally, where x is set at minus R, there is no probability of the default price-quality path being accepted: total revenue will always be insufficient, so the probability of a customised price-quality path is 1, F(x) =1.[181]

J19. This has an immediate implication that any optimal additional allowance (x) cannot be greater than the margin of error (R).There will be no case in which providing firms more revenue than they need under all probabilities that will be beneficial to consumers.

Modelling an optimal adjustment which benefits consumers

J20. We need to calculate an optimal value for x which minimises the total of the following costs.

J20.1 The expected cost of a customised price-quality path to consumers. If an additional allowance is included when we set the default price-quality path, but it fails to prevent the supplier from making a customised proposal, then the size of the additional allowance is irrelevant. This is because the cost of a customised price-quality path is incurred instead.

[181] Another implication of this is that the adjustment x enters the cumulative probability function as a negative value.

J20.2 The expected cost of the additional allowance to consumers. The additional allowance would only affect consumers if the supplier accepts the default price-quality path.

J21. The expected cost of a customised price-quality path to consumers can be denoted by:

$$E(Cost\ of\ a\ CPP) = F(x).C$$

J21.1 Here C denotes the cost of a customised price-quality path and F(x) is the cumulative probability function shown in equation 1. It states that the expected cost of a proposal is the probability of a customised price-quality path being proposed times the cost of a proposal.

J22. The expected cost of the additional allowance to consumers can be denoted by:

$$E(Additional\ Cost\ of\ a\ DPP\ \ from\ an\ additional\ allowance) = (1 - F(x)).x$$

J22.1 As our cumulative probability function is in respect of a proposal occurring, one minus this value gives the probability of a default price-quality path being accepted. This probability times the value of the adjustment (x) is the expected additional cost of a default price-quality path to consumers from an additional allowance.

J23. We therefore want to minimise the expected cost:

Equation 2

$$MinE(\cos t) = F(x).C + (1 - F(x)).x$$

J24. Substituting Equation 1 into Equation 2 gives:

$$MinE(\cos t) = \frac{(-x + R)}{2.R}.C + \left(1 - \frac{(-x + R)}{2.R}\right).x$$

J25. We can expand the right hand terms to:

$$MinE(\cos t) = \frac{-x.C}{2.R} + \frac{C}{2} + x + \frac{x^2}{2.R} - \frac{x}{2}$$

J26. To find the value of x which minimises this equation we differentiate with respect to x and set the equation equal to zero to find the turning point.

$$\frac{\partial E(\cos t)}{\partial x} = -\frac{C}{2.R} + 1 + \frac{2x}{2.R} - \frac{1}{2}$$

J27. Setting this derivative to zero and simplifying gives:

$$-\frac{C}{2.R}+\frac{1}{2}+\frac{x}{R}=0$$

$$\frac{x}{R}=\frac{C}{2.R}-\frac{1}{2}$$

Equation 3

$$x=\frac{C-R}{2}$$

J28. Equation 3 gives us the optimal value of an additional allowance when the default price-quality path is set, given the assumptions we laid out earlier, which is subject to the additional allowance always being smaller than R. This is because the additional allowance would never need to be larger than the margin of error in our forecasts.

The implications of the results

J29. Equation 3 has two main implications:

J29.1 When the margin of error is less than the cost of a customised price-quality path proposal, an increase in the default price-quality path by an additional allowance is beneficial to consumers; or

J29.2 When the margin of error is greater than the cost of a customised price-quality path proposal, a decrease in the default price-quality path would be beneficial to consumers.

J30. The intuition behind this is that we have essentially modelled costs and benefits to consumers of setting prices quite low, which risks a supplier making a customised price-quality path proposal, relative to setting prices quite high, which risks suppliers earning excessive profits. Importantly:

J30.1 Where prices are too low, suppliers have a fall back position of a customised price-quality path; or

J30.2 If prices are set too high, consumers have no such fallback position.

J31. Therefore, on an intuitive level, if the potential for too much revenue is large relative to the cost of a proposal—that is, if the margin of error in our forecasts is quite large—then consumers would better off if the supplier proposed a customised price-quality path. This is because costs could then be assessed more accurately.

J32. Nevertheless, we do not propose to apply any negative allowances, and so have set the floor for our calculations at zero.

Applying this model to the suppliers under this reset

J33. We have applied this model to the data we have received from suppliers to calculate the potential additional allowance.

We have assessed the margin of error with reference to the supplier's own forecasts

J34. One way we can assess the margin of error in our forecasts is by cross-checking our results against the supplier's own forecast. In particular, we can compare:

J34.1 The results of modelling each supplier's revenue requirement using our forecasts; and

J34.2 The results of modelling each supplier's revenue requirement using the supplier's own information.

J35. The difference between these two figures, assessed in present value terms over a three year period, provides the margin of error referred to in the remainder of this attachment.[182] The three year period corresponds to the present value period used to assess reset the price path.

Our estimates of the margin of error for each supplier

J36. Table J.1 overleaf shows the indicative margin of error that we have estimated for each supplier.

[182] In practice, this margin of error consists of the difference between our forecasts of opex and suppliers' forecasts of opex. As such, it is likely to underestimate the true margin of error.

Table J.1 Estimated margin of error in forecasts

Supplier	Commission forecast ($m)	Supplier forecast ($m)	Margin of error ($m)
Powerco	669	687	18.8
Unison	249	258	9.0
Alpine Energy	98	102	4.3
Centralines	27	30	3.3
OtagoNet	65	68	2.9
Electricity Ashburton	78	81	2.9
Top Energy	91	94	2.7
Network Tasman	75	78	2.4
The Lines Company	86	88	1.6
Eastland	55	57	1.3
Horizon Energy	54	56	1.3
Electricity Invercargill	34	35	1.0
Vector	1,087	1,086	-0.3
Nelson Electricity	19	18	-1.1
Wellington Electricity	287	282	-5.0
Aurora Energy	158	150	-7.8

J37. As we are unable to apply audit, verification or evaluation processes, we are unable to assess whether the margin of error for each supplier is the result of inaccuracies in our forecasts, or inaccuracies in the supplier's forecasts. Rather, the results indicate how far our forecasts could lie from the true value.

The implications of a negative margin of error

J38. In the case of a negative margin of error, there is no argument to include an additional allowance. This is because the supplier's forecast indicates that the supplier is unlikely to propose a customised price-quality path, irrespective of the accuracy of our forecast.

The implications of large margins of error

J39. The arguments in favour of introducing an additional allowance are also weak in the case of a large margin of error. For example, even assuming that a relatively complex customised price-quality path proposal costs $2.5m for Powerco or Unison, the potential savings to consumers of $2.5 million need to be laid against the potential cost to consumers of avoiding a proposal. In these cases, the margin of error is over $9 million. [183]

[183] $2.5m is our current view on the upper bound on the costs of a customised price-quality path, and is based on a relatively complex customised price-quality path proposal being made. For example, a proposal that is made in response to a catastrophic event, like an earthquake, and which may involve a significant amount of consultancy work to identify appropriate quality standards. In practice, the costs of

J40. As noted above, our model indicates we should not expect consumers to benefit where the margin of error is greater than the costs of a proposal.

The implications of the smallest error margins

J41. In the case of the smallest margin of error, we have used the formula derived in paragraphs J21–J31 above, and to find that an additional allowance of between $0 and $273k might be appropriate, ie, for Electricity Invercargill. The upper bound on the additional allowance is calculated by making the following simplifying assumptions:

J41.1 The upper bound on the cost of a complex customised price-quality path for Electricity Invercargill would be approximately $1.5m; and

J41.2 The probability of Electricity Invercargill making a proposal for a customised price-quality path is 50%, when in practice the probability is likely to be far lower.

J42. We have not, however, applied the additional allowance in reaching our draft decision because:

J42.1 The numbers are quite small even when we use assumptions from the upper bound of the range;

J42.2 The additional allowance would be closer to zero, or eliminated entirely, if we made more realistic assumptions; for example, because we rely on the suppliers own forecast of capital expenditure, the probability of a customised price-quality path is lower than 50%; and

J42.3 Submissions received to date indicate that we may be significantly under-estimating the margin of error for all suppliers, including Electricity Invercargill.[184]

J43. As a consequence of these calculations, we do not intend to include any additional allowances.[185]

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a customised price-quality path proposal are likely to be far lower if the proposal is motivated by revenue being too low under the default price-quality path.

[184] Submitters have previously argued that the margin of error is equivalent to around 0.84 percentage points returns for each supplier, ie, more than $3m for Electricity Invercargill when assessed over a three year time period. For the results of our previous analysis, refer: Commerce Commission, *July 2011 Draft Decision*, above n at 71.

[185] A banded approach was suggested by a number of suppliers, and remains the favoured option of some suppliers, including Powerco. We believe the analysis set out above is equally relevant to a banded approach. Hence, we do not propose to apply a banded approach for the reasons set out above, as well

The impact of making more realistic assumptions about the probability of a proposal

J44. If we made a more realistic assumption about the probability of a customised price-quality path proposal, there is a greater constraint on the margin of error under which an additional allowance is beneficial to consumers. If instead of having a symmetric distribution around zero error, we could assume that probability of proposing a customised price-quality path is lower than 0.5.

J45. The mathematics for this is very similar. We can model the shift in probabilities by a value β, for example if we wanted to shift the probabilities by 25% we can move these by adding $\beta = \frac{R}{2}$. Then our 'optimal' equation (equation 3) becomes $x = \frac{C - R + \beta}{2}$. To make the expected probability of a supplier proposing a customised price-quality path 0.25, we set $\beta = \frac{R}{2}$. This also implies the additional allowance cannot be greater than $\frac{R}{2}$, as any value above this point cannot reduce the probability of a proposal any further.

Varying the probability distribution

J46. Finally, we considered whether our results would change if we varied the assumed distribution of the margin of error. In the absence of any information about the shape of the probability distribution function, we assumed that a uniform distribution is appropriate. However, it could be that the probability of a large error is lower than the probability of a small error.

J47. A triangular distribution is an obvious choice in this context where the precise distribution is unknown. However, we do not believe this assumption would lead us to a different conclusion about the appropriate margin for error for each supplier. In our view, the accuracy of our modelling primarily relies on the margin of error, R, representing the true margin of error. And, in light of submissions, we consider our method of calculating the margin of error is more likely to underestimate the true margin of error than overestimate it.

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as the reasons set out in the July 2011 Draft Decision. Refer: Commerce Commission, *July 2011 Draft Decision*, above n at 71.

Attachment K: Information gathering requests

Purpose of this attachment

K1. This attachment explains why changes were required to the information we gathered from suppliers, and sets out examples of further information that we require.

Changes made to information provided by suppliers

K2. As with our July 2011 Draft Decision, a number of changes have been made to the information we gathered from suppliers.[186] Table K.1 below sets out the changes, including our reasons.

Table K.1 Changes made to disclosed information

Supplier and disclosed information that has been changed in our model	Reasons for change
Changes to information made prior to our July 2011 Draft Decision	
Aurora Energy – Positive permanent differences	Depreciation has been excluded as it does not meet the definition of positive permanent differences
The Lines Company – Positive temporary differences and Negative permanent differences	Depreciation has been excluded as it does not meet the definition of Positive temporary differences or Negative permanent differences
Unison – Sum of depreciation, Sum of opening RAB values of assets with nil physical asset life at end of the disclosure year 2010 and Sum of opening RAB values of disposed assets for the disclosure year 2010	Sum of depreciation, Sum of opening RAB values of assets with nil physical asset life at end of the disclosure year 2010 and Sum of opening RAB values of disposed assets for the disclosure year 2010 have been treated as positive rather than negative balances
Vector – Negative temporary differences	Negative temporary differences have been treated as a positive rather than negative balance

[186] We issued information requests under s 53ZD of the Act to suppliers on 16 March 2011, 15 June 2011, 6 September 2011, 18 April 2012 and 22 June 2012. We also sent a letter to suppliers on 2 September 2011 requesting information about changes to insurance premiums in light of the Canterbury earthquakes. Copies of these information requests and corresponding issues registers are available at http://www.comcom.govt.nz/2010-2015-default-price-quality-path/.

Supplier and disclosed information that has been changed in our model	Reasons for change
Changes made between our July 2011 Draft Decision and this revised draft decision	
OtagoNet Joint Venture – proposed asset adjustments in respect of changes to replacement costs for transformers and zone stations	An amount of $0.793m (2004 dollars) has been disallowed on the basis that section 2.2.1 of the IM does not provide for adjustments to replacement costs. For the purposes of this draft decision, pending the receipt of an updated Schedule A3, we have changed the proposed asset adjustment value by adjusting the 2008/09 modified asset values so as to preserve the existing ratio between total proposed adjustments and modified asset values, and making similar proportionate adjustments to the FDC allowance, and 2010 depreciation
Nelson Electricity – basis of estimate of proportion of line charge revenue from residential ICPs	Nelson Electricity told us that its ability to accurately identify revenue from residential users has reduced. We have used the average of the ratios for 2007/08 and 2008/09 instead of the average for 2007/08-2010/11
Electricity Invercargill – other regulated income	Electricity Invercargill had a particularly large amount of other income in 2008 which is unlikely to recur. Rather than using the arithmetic average for 2008-2011, our average is calculated excluding 2008
Horizon Electricity – other regulated income	In 2008/09 a large proportion of Horizon's other regulatory income was from the proceeds of litigation in terms of its stated 'Committed Supply Agreements'. We have excluded this amount from the calculation as we do not expect such payments to regularly occur
Wellington Electricity – other regulated income	We excluded the 2008 value for Wellington Electricity from the calculation as at that time it was still part of Vector
All EDBs – Insurance cost forecast increases	We have excluded the captive insurance amount submitted by one supplier as it does not meet the criteria for captive insurer A small number of suppliers forecast unusually large increases in insurance expenditure. Our draft decision includes these forecasts. We will, however, review the supporting evidence suppliers have provided to us in more detail and may request further clarification from some suppliers on their supporting evidence before we make our final decision

K3. Table K2 below also sets out disclosed information that we have identified as being incorrect, but that we have not had to change because it is not required as an input to our model.

Table K.2 Incorrectly disclosed information that has not been changed

Supplier and disclosed information identified as incorrect	Reasons for change is not required
General – a number of suppliers have interpreted part of Schedules A3 and A5 incorrectly. The percentage of value allocated to the regulated service should represent the percentage of value allocated using allocator or method applicable to the value allocated to the regulated service, ie, not the total value that could be allocated.	The information as disclosed provides more detailed information than required. Also the information is not used as an input in our model.
Alpine Energy – Schedule A5 does not include information about assets commissioned during the year.	The required information was disclosed to the Commission in the non-public version of Schedule A5. Also the information is not used as an input in the model.
Electricity Ashburton – Schedule A3 does not tie to Schedule A5 in that the difference between the Unallocated RAB and the RAB values does not equal the value allocated to non-electricity distribution services as disclosed in Schedule A5.	The RAB values disclosed in Schedule A3 and A5 are consistent and it is only that number that is used as an input in the model.
Vector – Vector have identified that the disclosure of the 2008/09 modified asset values includes a $10m increase in value resulting from the application of the cost allocation input methodology. The increase in value should not be included in RAB value line items prior to the Sum of opening RAB values – disclosure year 2010 line item.	The RAB values disclosed in Schedule A3 and A5 are consistent and it is only that number that is used as an input in the model.

Why we require further information

K4. In reaching our revised draft decision, we have identified a number of outstanding pieces of information that suppliers will be required to provide. In particular, some proposed asset value adjustments are still to be finalised. In addition, further information is needed to clarify data supplied previously, and/or to allow us to implement our revised draft decision.

Issues with proposed asset value adjustments

K5. Some proposed asset value adjustments are still to be finalised. In particular:

K5.1 OtagoNet's proposed adjustment in respect of changes to replacement costs for transformers and zone stations has been disallowed and we will require OtagoNet to revise its corresponding information so as to reflect the impact of this change;

K5.2 An issue with Vector's internally generated intangible assets is unresolved. If the corresponding proposed adjustment is disallowed, we will require Vector to revise its corresponding information; and

K5.3 Electricity Invercargill has submitted a late proposed adjustment. We have not been able to consider the proposed adjustment in time for this draft decision.

K6. We also intend to seek information from suppliers that allow us to reconcile the adjustments made to 2004 assets values, and more recent opening RAB values.

Further information gathering requests

K7. We will soon issue further information gathering requests to obtain information that would allow us to implement our revised draft decision. Examples of the types of information we are likely to request are shown in table K.3 below.

Table K.3 Examples of information required

Type of information	Where discussed
Confirmation of the 2009/10 AMP capex forecast assumptions	Attachment B
Clarification of supporting evidence on insurance	Attachment C
Opex split by labour costs and non-labour costs (2010 to 2011)	Attachment C
Impact of data cleansing on network length data disclosed under information disclosure regulation (2004 to 2011)	Attachment C
Losses on disposal and disposed assets (2008 to 2010)	Attachment E
Reconciliation of asset adjustments and asset values	Attachment K

Attachment L: Giving effect to the proposed price adjustments

Purpose of this attachment

L1. This attachment explains the amendments we propose to make to the determination (other than those discussed in Attachment M) to give effect to the reset price path.[187] In particular, we discuss:

L1.1 How the price paths will be amended;

L1.2 What outputs from our modelling will be reflected in the determination;

L1.3 How maximum weighted average prices for 2013/14 will be determined;

L1.4 How maximum weighted average prices for 2014/15 will be determined;

L1.5 How starting prices will be determined;

L1.6 The rates of change that apply to each supplier; and

L1.7 How claw-back will be determined.

How the price paths will be amended

L2. We propose to amend the price path for suppliers in the following ways:

L2.1 The reset price path will take effect from 1 April 2013; at this time a supplier will be either allowed to increase or required to reduce its weighted average prices depending on whether the supplier is earning less than or more than the maximum allowable revenue that we calculate;

L2.2 The price path will shift up or down depending on whether the supplier's starting prices are adjusted up or down;

L2.3 For certain suppliers, it is necessary to set alternative rates of change, ie, alternative to the industry wide rate of change of CPI-0%, to minimise potential price shocks to consumers over the last two years of the regulatory period; and

L2.4 For all suppliers, we will claw-back under- or over-recoveries of the maximum allowable revenue that we have calculated for 2012/13. For those suppliers that we set capped alternative rates of change, ie, at CPI+15% in each year, we will allow for additional claw-back. Claw-back will be included as a recoverable cost in 2014/15, except where it would exacerbate price shocks

[187] Amendments to s 52P determinations may be made under s 2Q of the Act.

to consumers. If claw-back is not included as a recoverable cost in 2014/15 then the recovery will be smoothed over the next regulatory period.

L3. Although the price path would be adjusted from the start of the regulatory period, suppliers will not be required to demonstrate compliance with the reset price path for the period 2010/11 to 2012/13. Table L.1 below sets out the different components that we specify in the draft determination to give effect to the reset.

Table L.1 Giving effect to the reset in the determination

Component to be specified in the determination	Proposed approach	Additional comments
The maximum weighted average prices that each supplier can charge in 2013/14	For most suppliers, specify a formula whereby suppliers can determine their allowable notional revenue for 2013/14 using a specified maximum allowable revenue for 2013/14 and relevant constant price revenue forecasts For suppliers where we have capped their alternative rates of change, use the formula that currently exists in the determination for calculating allowable notional revenue	The proposed reset takes effect from 1 April 2013 At this time, a supplier will be either allowed to increase or required to reduce its weighted average prices depending on whether the supplier receives an upward or downward adjustment to its starting prices Suppliers can derive their maximum weighted average prices from allowable notional revenue Suppliers will only be required to demonstrate compliance with the reset price path for 2013/14 and 2014/15
The maximum weighted average prices that each supplier can charge in 2014/15	Use the formula that currently exists in the determination for calculating allowable notional revenue	Suppliers can derive their maximum weighted average prices from this allowable notional revenue
The starting prices or maximum weighted average prices that would have applied to each supplier at the start of the regulatory period	Specify starting prices as a maximum allowable revenue for 2010/11	Adjustments to suppliers' starting prices change their price paths from the start of the regulatory period. This change has no practical effect, ie, suppliers will not be required to retrospectively demonstrate compliance
The rates of change that apply to each supplier	Specify for certain suppliers the alternative rates of change that relate to 2013/14 and 2014/15	Alternative rates of change that relate to 2013/14 are capped and will only be specified for certain suppliers

Component to be specified in the determination	Proposed approach	Additional comments
How claw-back will be determined for each supplier	Specify a formula whereby specified suppliers can determine claw-back amounts to be included as recoverable costs in 2014/15	We will consult on the claw-back amounts not recovered in this regulatory period, and the process for smoothing, as part of the next reset

Outputs from our modelling that are reflected in the determination

L4. The following outputs from our modelling are required in the determination:

L4.1 Maximum allowable revenue for any year of the regulatory period;

L4.2 Where applicable, alternative rates of changes; and

L4.3 Constant price revenue forecast.

L5. We propose to use these outputs to help determine the components discussed in table L.1 above. Certain outputs will be reflected in the determination.

General formula for calculating maximum weighted average price for 2013/14

L6. This section explains the formula that suppliers would use to calculate maximum weighted price for 2013/14, provided they are not subject to a CPI+15% cap on their year-on-year price increases.

L7. It is necessary to convert maximum allowable revenue to be consistent with the price paths in the determination. The price paths in the determination are represented by allowable notional revenue, which is specified consistent with the specification of price input methodology that applies to default price-quality paths.[188]

L8. Maximum allowable revenue and allowable notional revenue are not comparable because the quantities implied in the revenue values relate to different periods. Maximum allowable revenue can be converted into allowable notional revenue by adjusting for the difference in the two sets of quantities.

[188] Revenue values that are 'notional' are a combination of the individual prices for different goods or services in a given period and the quantities corresponding to those prices from a different period (eg, two years prior).

Determining allowable notional revenue for 2013/14

L9. Each supplier can determine what its permitted maximum weighted average prices are for 2013/14 using the equation in Box L.1 below.[189]

Box L.1 Allowable notional revenue for 2013/14

$$R_{2013/14} = \frac{MAR_{2013/14} + (K_{2013/14} + V_{2013/14})}{\Delta D_{2012/13-2013/14}} - (K_{2013/14} + V_{2013/14})$$

where:

$R_{2013/14}$	is the allowable notional revenue for 2013/14.
$MAR_{2013/14}$	is the maximum allowable revenue for the year 2013/14, as specified in Table L.2.
$\Delta D_{2012/13-2013/14}$	is the constant price revenue for 1 April 2012 to 31 March 2013 and 1 April 2013 to 31 March 2014, as specified in Table 2.[190]
$K_{2013/14} + V_{2013/14}$	is the sum of all pass-through costs and recoverable costs for the 2013/14 assessment period, which need to be forecasted by the supplier.

189 For detail on how this equation is derived, see Appendix E of our July 2011 Draft Decision.

190 Specifically, the constant price revenue rates for each of the years are multiplied together, ie, $\Delta D_{2012/13-2013/14} = (1 + \Delta CPR_{2012/13})(1 + \Delta CPR_{2013/14})$.

Table L.2 Inputs for determining allowable notional revenue for 2013/14

Supplier	Maximum allowable revenue for 2013/14 ($AR_{2013/14}$) $m	Constant price revenue for 2012/13 to 2013/14 ($\Delta D_{2013/12\text{-}2013/14}$)
Alpine Energy	n/a	n/a
Aurora Energy	60.2	1.01
Centralines	n/a	n/a
Eastland	21.1	1.00
Electricity Ashburton	29.6	1.02
Electricity Invercargill	12.8	1.00
Horizon Energy	20.7	1.01
Nelson Electricity	7.2	1.02
Network Tasman	28.6	1.02
OtagoNet	23.6	1.00
Powerco	254.6	1.01
The Lines Company	n/a	n/a
Top Energy	n/a	n/a
Unison	94.8	1.01
Vector	413.9	1.03
Wellington Electricity	109.4	1.01

L10. Consistent with the price path compliance formula in clause 8.4 of the determination, a supplier's notional revenue (given by the equation in Box L.2 overleaf) must not exceed the allowable notional revenue for any given year.

L11. This implementation approach uses simple mathematical relationships between variables in the price path compliance formula. It also assumes that allowable notional revenue for any given year (rolled forward using the price path compliance formula) will coincide with notional revenue in that year.

L12. The constant price revenue forecasts that we use for 2012/1 3 and 2013/14 (as discussed in Attachment F) are used to determine $\Delta D_{2012/13-2013/14}$ in the equation in Box L.1. Dividing by the constant price revenue forecasts discounts the quantities implied in the maximum allowable revenue for 2013/14 by two years to be consistent with allowable notional revenue that uses quantities from two years before.

Box L.2 Notional revenue for 2013/14

$$NR_{2013/14} = \sum_i P_{i,2013/14} Q_{i,2011/12} - (K_{2013/14} + V_{2013/14})$$

where:

$P_{i,2013/14}$	is the ith price for the year 2013/14.
$Q_{i,2011/12}$	is the quantity corresponding to the ith price during 2011/12.
$K_{2013/14} + V_{2013/14}$	is the sum of all pass-through costs and recoverable costs for the 2013/14 assessment period.

Why we have not included the revenue differential term

L13. Some submissions on our July 2011 Draft Decision suggested that the equation in Box L.1 should also incorporate the revenue differential adjustment term ($R_{t-1}\,NR_{t-1}$), the difference between a supplier's allowable notional revenue and notional revenue from the previous year.[191] The revenue differential term currently appears in clause 8.4 of the determination when calculating allowable notional revenue for years after 2010/11.

L14. We do not consider it is necessary to include the revenue differential term in the equation in Box L.5 as the proposed reset establishes a new price path.

L15. The revenue differential term:

L15.1 Is designed to ensure that the price path is set and remains independent of regulated suppliers' pricing behaviour within the regulatory period; and

L15.2 Is not designed to allow suppliers to recoup any under-recovery in a previous year.[192]

L16. We do propose, however, that the revenue differential term be reinstated for 2014/15 ie, the year following the reset.

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191 ENA "Submission on 2010-15 Default Price-Quality Path for Electricity Distribution Businesses Draft Decisions Paper" 24 August 2011, pp. 23-27; Nelson Electricity "Submission to the Commerce Commission on the 2010 -15 Default Price Quality Path Reset Draft Decisions Paper" 24 August 2011, p. 6; PwC "Submission to the Commerce Commission on 2010-15 Default Price-Quality Path for Electricity Distribution Businesses Draft Decisions Paper" 24 August 2011, p. 13; Vector "Submission to Commerce Commission on Draft Decision on Starting Price Adjustments for Electricity Distribution Businesses" 24 August 2011, p. 36; Wellington Electricity "Submission on the 2010-15 Default Price-Quality for Electricity Distribution Draft Decisions Paper" 24 August 2011, pp. 8-9; and Wellington Electricity "Cross Submission on the submissions made on the '2010-15 Default Price-Quality for Electricity Distribution Draft Decisions Paper'" 5 September 2011, p. 7.

192 Commerce Commission "2010-2015 Electricity Distribution Default Price-Quality Path Revenue Differential Term Amendment, Reasons Paper" 30 November 2011.

Reasons for proposed implementation approach

L17. There are a number of alternative ways of deriving allowable notional revenue in 2013/14 from the maximum allowable revenue that we have determined for each supplier depending on what assumptions are made. We consider that the proposed implementation approach set out above uses a set of assumptions that provides the best combination of simplicity, accuracy and transparency.[193]

Submissions on setting allowable notional revenue for 2013/14

L18. The proposed calculation of allowable notional revenue in 2013/14 is the same as that expressed in our July 2011 Draft Decision. No objections were raised in submissions on this approach, other than the suggested inclusion of the revenue differential term, and no alternatives were suggested.

Formula for calculating weighted average prices for 2013/14 when a CPI+15% cap applies

L19. Where we have capped alternative rates of change for a supplier, we propose that allowable notional revenue for 2013/14 is calculated in line with the current clause 8.4 of the determination. In this instance, the alternative rate of change used to calculate allowable notional revenue for this period is CPI+15%.

How maximum weighted average prices for 2014/15 will be determined

L20. For the last year of the regulatory period (2014/15), allowable notional revenue will be calculated in line with the current clause 8.4 of the determination. Any alternative rate of change that is determined for a supplier will apply when calculating allowable notional revenue for 2014/15.

Actual growth rates may differ from our constant price revenue forecasts

L21. If suppliers are able to grow quantities faster than implied by our constant price revenue forecasts, suppliers will earn higher revenues than we projected (and vice-versa).

L22. Submissions have suggested using a wash-up mechanism to reduce the risk of under-or over-estimating constant price revenue.[194]

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[193] As is the case in the existing price path compliance formula, which requires pass-through and recoverable costs need to be forecast for the upcoming assessment period, this option requires pass-through and recoverable costs for 2013/14 to be forecast.

[194] Aurora "Submission to the Commerce Commission on its Draft Decisions Paper (July 2011) on 2010-15 Default Price Quality Path for Electricity Distribution" 24 August 2011, p. 9; ENA "Submission on 2010-15 Default Price-Quality Path for Electricity Distribution Businesses Draft Decisions Paper" 24 August 2011, pp. 23-27; Horizon "Submission to Commerce Commission on 2010-15 Default Price-Quality Path Reset of Starting Prices, CPI Adjustment and Other Amendments Draft Decisions Paper" 24 August 2011, pp. 22-23; PwC "Submission to the Commerce Commission on 2010-15 Default Price-Quality Path for Electricity Distribution Businesses Draft Decisions Paper" 24 August 2011, p. 13; Vector "Submission to Commerce

L23. We think it may be advantageous to include a wash-up mechanism to address this matter. Unfortunately, due to the timing of the reset there are practical difficulties in implementing the wash-up in full before the end of the regulatory period. Ordinarily we consider the wash-up could be completed within three years of a reset, but not within two years.

L24. Vector suggested 8-9 months of actual data will be available for when calculating allowable notional revenue for 2014/15. Although not ideal, this option may provide for some wash-up in the current regulatory period.

L25. We welcome further views on a potential wash-up mechanism and how it would be implemented into the determination, including audit considerations.

How starting prices will be determined

L26. We propose to specify starting prices in terms of maximum allowable revenue for 2010/11. Note that this maximum allowable revenue has no practical effect ie, suppliers are not required to reassess compliance for 2010/11.

L27. We have used the equation in Box L.3 to determine maximum allowable revenue for 2010/11. The equation in Box L.3 establishes a relationship between maximum allowable revenue in consecutive years by adjusting for annual rate of change, including the CPI, and adjusting for the change in constant price revenue.

Box L.3 Calculating allowable notional revenue for the previous year

$$MAR_{t-1} = \frac{MAR_t}{(1+\Delta \text{CPI}_t)(1-X_t)(1+\Delta CPR_t)}$$

where:

MAR_{t-1}	is the maximum allowable revenue for the period *t*-1 consistent with the reset price path in 2013/14
MAR_t	is the maximum allowable revenue for the period *t* consistent with the reset price path in 2013/14
ΔCPI_t	is the derived change in the CPI to be applied during the period *t*
X_t	is the X factor for the period *t*
ΔCPR_t	is the change in constant price revenue corresponding to the period *t*

Commission on Draft Decision on Starting Price Adjustments for Electricity Distribution Businesses" 24 August 2011, p. 37; Wellington Electricity "Submission on the 2010-15 Default Price-Quality for Electricity Distribution Draft Decisions Paper" 24 August 2011, pp. 3 and 10; and Wellington Electricity "Cross Submission on the submissions made on the '2010-15 Default Price-Quality for Electricity Distribution Draft Decisions Paper'" 5 September 2011, p. 7.

The rates of change that apply to each supplier

L28. The annual rate of change in prices, ie, CPI-X%, applying to suppliers is CPI-0% unless otherwise specified in Table L.3 below. An alternative rate of change for 2013/14 is only specified for suppliers where we consider it is necessary to spread adjustments over more than one year. In all but one of these cases, the change has been capped at CPI+15% year on year.

Table L.3 Supplier-specific rates of change

Supplier	Annual rate of change in price for 2013/14	Annual rate of change in price for 2014/15
Alpine Energy	CPI+15%	CPI+15%
Centralines	CPI+15%	CPI+15%
OtagoNet	n/a	CPI+11%
The Lines Company	CPI+15%	CPI+15%
Top Energy	CPI+15%	CPI+15%

How claw-back will be calculated and recovered

L29. As discussed in Chapter 7, we propose to apply some claw-back for previous under- and over- recoveries. We propose that claw-back is treated as a recoverable cost for 2014/15, unless this treatment would further exacerbate price shocks to consumers.

L30. We propose that certain suppliers will be required to smooth the recovery of claw-back over the next regulatory period. This will be the case where we expect the application of the total claw-back would result in price increases from 2013/14 to 2014/15 of more than CPI+15%.

L31. We do not consider how claw-back will be smoothed into the next regulatory period in this paper, nor how we would calculate the amount to be clawed back for suppliers that would be subject to the CPI+15% cap. We propose to consult on these matters as part of the next reset. This is because we will first need to consider the likely impact of any price changes that are made at that reset. Nonetheless, we would welcome submissions on this matter in response to this paper

How claw-back will be calculated

L32. We propose that the total amount of claw-back associated with under- or over-recovery will be calculated using the equation in Box L.4. We have expressed the claw-back amount as recoverable costs for 2014/15 as the calculation relies on information that will not be available when suppliers set their prices for 2013/14.

Box L.4 Claw-back in 2014/15

$$clawback_{2014/15} = (MAR_{2012/13} - \omega)(1 + 0.0877)^2$$

where:

$clawback_{2014/15}$	is the claw-back amount to be treated as recoverable costs for 2014/15
$MAR_{2012/13}$	is the maximum allowable revenue for the year 2012/13, which can be calculated in accordance with Equation L.1 above
ω	is the maximum of: (a) Line charge revenue as disclosed under information disclosure for 2012/13 *less* actual pass-through costs and actual recoverable costs for 2012/13; or (b) Permitted revenue for 2012/13 *less* actual pass-through costs and actual recoverable costs for 2012/13. In (b) above, permitted revenue for 2012/13 is the combination of the maximum permitted prices for 2012/13, as derived from allowable notional revenue for 2012/13, and the actual 2012/13 quantities corresponding to each of those prices.

L33. A supplier's under- or over- recovery of revenue in 2012/13 underpins the calculation of claw-back. The under- or over- recovery is represented in the equation in Box L.4 as $MAR_{2012/13} - \omega$. This is the difference between the maximum allowable revenue for 2012/13 (which can be calculated using the equation in Box L.1), and the maximum of either the actual net revenue for 2012/13, or the net permitted revenue derived using maximum permitted prices for 2012/13. We use the maximum of these two revenue values because we do not consider it appropriate for the claw-back amount to include any under-recovery of revenue that a supplier was permitted to earn in 2012/13.

L34. We note that it is unlikely to be appropriate to apply the 75th percentile estimate of the cost of capital when determining the present value of the amount to be clawed back. This is because the rationale behind applying a 75th percentile estimate is to address the asymmetric risk of regulatory error, which cannot be reduced through other means, and could affect incentives for future investments. In our view, the effect on incentives is not a primary consideration in this instance, because claw-back applies to over- or under-recovery that has already occurred.

L35. In this draft decision, we propose to use a cost of capital calculated in accordance with input methodologies, but as noted in Chapter 7, we note that alternative rates may be a more suitable rate to use. We therefore invite submissions on the appropriate time value of money that we should use to present value any claw back amounts.

What suppliers will treat claw-back as recoverable costs in 2014/15

L36. We propose to identify the suppliers that will be required to treat claw-back as recoverable costs in 2014/15. We have identified the relevant suppliers as being those that would not breach a CPI+15% price shock if claw back was applied. In particular, only those suppliers that haven't had their price adjustment smoothed would tread claw back as a recoverable cost in 2014/15.

L37. All other suppliers would have to opportunity to recover claw back amounts after 1 April 2015.

Attachment M: Other proposed changes to the default price-quality path

Purpose of this attachment

M1. This attachment sets out a number of changes proposed to the default price-quality path determination to apply re-determined input methodologies for electricity distribution services.

We are required to apply input methodologies to the price path

M2. We propose to amend the default price-quality path governing suppliers to reflect the input methodologies which apply to each supplier's path.[195]

M3. To this effect, we propose to issue a new determination which will supersede *Commerce Act (Electricity Distribution Default Price-Quality Path) Determination 2010 Decision 685* (Decision 685) for all suppliers except Orion New Zealand Limited.[196]

M4. Orion New Zealand Limited is not subject to the reset, and will remain subject to the default price-quality path set out in Decision 685 (including all amendments up to, and including, 22 March 2012).

Changes reflected in the new determination

M5. The new determination will update Decision 685 to reflect re-determined input methodologies.[197] We discuss below some of the key changes for suppliers to be aware of.

Pass-through cost have changed with a new category recoverable costs introduced

M6. Suppliers have typically been allowed to pass some costs—called pass-through costs— through to prices during the regulatory period as these costs are outside the control of the supplier.

M7. Input methodologies change what costs can be passed through by providing a new definition of pass-through costs, and introducing 'recoverable costs' as a second category of costs that suppliers are able to pass through to prices.[198]

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[195] We are permitted to change the s 52P determination governing the default price-quality paths under s52Q. We have already consulted on the amendments as part of determining the relevant input methodologies. It is appropriate to update the determination to reflect the input methodologies as part of the reset process under s 54K(3). (We also refer to our obligation to apply the input methodologies under s 52S.)

[196] Suppliers will need to demonstrate compliance with the default price-quality path set out in *Decision 685* for the Third Assessment Period (1 April 2012-31March 2013). This is because the new prices arising from the reset will only take effect from 1 April 2013.

[197] These input methodologies are set out in Parts 3 and 4 of Decision 710: Commerce Act (Electricity Distribution Services Input Methodologies) Determination 2010.

M8. The new definition of pass-through costs has narrowed to include only levies outside the control of suppliers. Examples of these include local authority rates, Commerce Act levies, Electricity Industry Act levies, and Electricity and Gas Complaints Commission levies.[199]

M9. The new recoverable cost category includes transmission charges, and avoided transmission charges (previously defined as pass-through costs), and allows for certain costs associated with claw-back, customised price-quality path proposals, and the incremental rolling incentive scheme, to be recovered.

M10. To give effect to recoverable costs within the compliance assessment formula, we have included a 'V' term.[200]

Avoided transmission charges have changed

M11. Suppliers have previously been able to recover 'avoided transmission charges' arising from activities that substitute for the use of the transmission system.

M12. Input methodologies change avoided transmission charges in three ways.

M12.1 The scope of 'activities' for which costs can be recovered has narrowed: Suppliers will now only be able to recover costs where they have purchased an asset from Transpower, ie, not where they have built their own assets substituting use of the transmission system. Previously, suppliers were able to recover costs where they had built their own assets that substituted for the use of the transmission system.[201]

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198 The main distinction between these two categories is the extent to which they are controllable by the regulated supplier. Pass-through costs are those costs that are outside the control of the supplier and can be passed through to consumers without the Commission needing to undertake any assessment of these costs. Recoverable costs are not completely outside the control of the supplier, and there may be judgement involved as to how much should be passed through. In some cases, an approval process is required before the costs can be recovered (see paragraphs M15-M17 below regarding approval of charges in respect of new investment contract charges, and avoided transmission charges).

199 These levies are subject to meeting the requirements of clause 3.1.2(1), (3) & (4).

200 Ideally we would have used 'R' to more easily identify the term as representing recoverable costs. However, this was already in use representing notional revenue.

201 The reasons for this change are set out in J2.24 to J2.27 of the December 2010 input methodologies reasons paper.

M12.2 Avoided transmission charges are now a recoverable cost, not a pass-through cost: This means they are still able to be recovered, but no longer meet the strict definition of pass-through costs. The difference between recoverable costs and pass-through costs is discussed in paragraph M7 above.[202]

M12.3 Suppliers are now required to meet an approval process: This is because the regulated supplier has a degree of control over the level of these particular costs. As a check on the appropriate level of costs to be passed through to consumers, it is appropriate to assess applications for approval of recoverable costs on a case-by case basis. Details of this process are included below in paragraphs M15 to M17.

Transmission charges have changed

M13. Suppliers have traditionally been able to recover the cost of charges it pays to Transpower for use of the transmission system.

M14. Input methodologies change 'transmission charges' in two ways.

M14.1 The charges are now a recoverable cost, not a pass-through cost: This means they are still able to be recovered, but no longer meet the strict definition of pass-through costs. The difference between recoverable costs and pass-through costs is discussed in paragraph M7 above.

M14.2 Suppliers will now only be able to recover payments made to Transpower instead of the previous payments made 'in respect of the Transmission System'.

Process for approving recoverable costs

M15. Input methodologies require that certain recoverable costs be approved as a check on the appropriate level of costs to be passed through to consumers. To do this, an approval process is to be specified by the Commission as part of the default price-quality path.

M16. To this effect, the default price-quality path now includes a process for the approval of avoided transmission charges and charges payable in respect of new investment contracts, to be assessed ex-post as part of annual compliance.

M17. For avoided transmission charges the proposed process requires suppliers to provide:

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[202] The explicit definition of 'Avoided transmission charges' has also been removed as it is no longer explicitly used within the input methodologies determination. Instead the default price-quality path determination now refers back to the definition of recoverable costs under clause 3.1.3 of the input methodologies.

M17.1 Evidence that a transaction took place with Transpower (suppliers can only recover cost as avoided transmission charges where the supplier has purchased assets from Transpower); and

M17.2 Evidence that the amount of charge recovered is consistent with the asset purchased (in the first year this is to be derived from the prices specified in Transpower's pricing schedule for the asset, and in subsequent years, derived from prices consistent with the Transmission Pricing Methodology).

M18. For charges payable in respect of new investment contracts, the proposed process requires suppliers to provide proof of the amount of charge relating to the contract entered into.

Process for taking account of amalgamations

M19. Input methodologies specify a process for reporting compliance where suppliers have completed an amalgamation within the regulatory period.

M20. To apply the amalgamations input methodology to the default price-quality path we have:

M20.1 Reflected the amalgamations input methodology and other merger transactions in clause 10.1; and

M20.2 Specified that transactions other than amalgamations will be considered on a case by case basis in clauses 10.2 to 10.4.

M21. Both of these changes are set out in a new 'Transactions involving Non-exempt EDBs' section which replaces the previous 'Mergers and Acquisitions' section. The title has been changed to better reflect the content of the section.

M22. We note that the changes relating to transactions *other* than amalgamations do not result from any input methodologies. We have made these changes to provide further clarity to help suppliers comply with the default price-quality path.

M23. The case by case basis we are proposing was first consulted upon as part of the July 2011 Draft Decision and takes account of submissions on this process.[203] To clarify, we intend to use the information provided under clause 10.3(a) to assist the supplier to demonstrate compliance with the default price-quality path for assessment periods following the one in which the transaction occurred.

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[203] For example, ENA, *Submission on 2010-15 Default Price-Quality Path for Electricity Distribution Businesses Draft Decisions Paper,* 24 August 2011, page 30.

Summary of proposed changes

M24. For quick reference, a table summarising the changes to the determination is included below.

Table M.1 Summary of proposed changes

Topic	Description	Determination reference	
		Default price-quality path	**Input methodologies**
Recoverable costs added to the price path	Transmission charges avoided transmission charges New investment contracts Claw-back IRIS	Definition specified in clause 4.1 Approval process specified in clauses 11.3(d) and 11.4 'V" term added to represent recoverable costs in the compliance formula in clause 8.4	Clause 3.1.3(1)
Pass-through costs definition updated	Pass-through costs include: Local authority rates certain levies specified in the input methodologies	Definition specified in clause 4.1	Clause 3.1.2(2) & (4)
GST definition updated	Updated to reflect input methodologies	Definition specified in clause 4.1	Clause 1.1.4(2)
Director definition updated	Updated to reflect input methodologies	Definition specified in clause 4.1	Clause 1.1.4(2)
Price definition updated	Updated to reflect input methodologies	Definition specified in clause 4.1	Clause 1.1.4(2)
Posted Discount definition updated	Updated to reflect input methodologies	Definition specified in clause 4.1	Clause 1.1.4(2)
Electricity distribution service definition updated	Updated to reflect input methodologies	Definition specified in clause 4.1	Clause 1.1.4(2)
CPI definition updated	Updated to reflect input methodologies	Definition specified in clause 4.1	Clause 1.1.4(2)
Electricity Commission levy definition removed	Updated to reflect input methodologies	n/a	Clause 1.1.4(2)
Commerce Act levy definition removed	Updated to reflect input methodologies	n/a	Clause 1.1.4(2)
Transmission charges	Updated to reflect	n/a	Clause 1.1.4(2)

Topic	Description	Determination reference	
		Default price-quality path	**Input methodologies**
definition removed	input methodologies		
Transactions involving Non-exempt suppliers	Gives effect to the amalgamations input methodologies and clarifies the process for compliance for transactions other than amalgamations is to be made on a case by case basis	Process set out in Clause 10	Clause 1.1.4(2)

List of acronyms and abbreviations

Acronym / abbreviation	Definition
AMP	Asset Management Plan
CGPI	Capital Goods Price Index
CPI	Consumer Price Index
ICP	Installation Control Point
ID	Information Disclosure
LCI	Labour Cost Index
PEG	Pacific Economics Group
PFP	Partial Factor Productivity
PPI	Producer Price Index
RESET	Regression Equation Specification Error Test
WACC	Weighted Average Cost of Capital