

**Further Submission on the  
Method to Adjust DPP Starting Prices**

From the Electricity Networks Association

10 December 2010

## Electricity distribution businesses supporting this submission

The electricity distribution businesses listed below support this submission.

Alpine Energy Ltd  
Aurora Energy Ltd  
Buller Electricity Ltd  
Centralines Ltd  
Counties Power Ltd  
Eastland Network Ltd  
Electra Ltd  
Electricity Ashburton Ltd  
Electricity Invercargill Ltd  
Horizon Energy Distribution Ltd  
Mainpower NZ Ltd  
Marlborough Lines Ltd  
Nelson Electricity Ltd  
Network Tasman Ltd  
Network Waitaki Ltd  
Northpower Ltd  
Orion New Zealand Ltd  
OtagoNet Joint Venture  
Powerco Ltd  
Scanpower Ltd  
The Lines Company Ltd  
The Power Company Ltd  
Top Energy Ltd  
Unison Networks Ltd  
Vector Ltd  
Waipa Networks Ltd  
WEL Networks Ltd  
Wellington Electricity Lines Ltd  
Westpower Ltd

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## Executive summary

1. Electricity distribution services are subject to the Part 4 default price-quality path (DPP) regulatory regime of the Commerce Act. This DPP regime involves regulatory periods of typically five year duration, at the end of which the Commerce Commission (Commission) is able to reset the DPP. Legislation enables the Commission, when resetting the price component of a DPP, to either use those prices existing at the end of the regulatory period that is about to expire, or to adjust those prices “*based on the current and projected profitability of each supplier*”. This submission proposes a method for adjusting those prices for non-exempt EDBs and recommends that this method be used for any reset of the current DPP (which may be reset once input methodologies have been published, as part of the implementation of the Part 4 regime).
2. The legislative context for adjusting DPP starting prices includes the purpose of Part 4 and of its subpart 6 (default/customised price-quality regulation), and aspects of section 53P (resetting starting prices, rates of change, and quality standards). The Commission is also obliged to undertake this task in a manner consistent with good regulatory practice. The ENA considers these obligations require a method for adjusting DPP starting prices that conforms to the following principles:
  1. is a relatively low-cost way of setting the default price path;
  2. promotes outcomes consistent with those produced in workably competitive markets;
  3. ensures that (a) to (d) of the purpose of Part 4 are achieved, and in the event that a tension arises between (a) and other subparagraphs (in particular, with (d)), the Commission must give priority to (a);
  4. from the range of alternatives, is the best method that meets the purpose statements; and
  5. is consistent with the principles of good regulatory practice.
3. The “*current and projected profitability of each supplier*” is not a defined term under Part 4. The Commission, in its DPP Discussion Paper of 5 August, implies that the Return on Investment (ROI) measure should be used to estimate current and projected profitability. The ENA agrees, as it is an indicator of profitability that has been designed to be broadly comparable to an estimate of the weighted average cost of capital (WACC), is widely understood, and has been reported on for some years (albeit with some variation in the method of measurement).
4. Principle 1 above (that the method to adjust DPP starting prices must be relatively low-cost) reflects one of the legislative distinctions between the DPP and the customised price-quality path (or CPP). If the ROI measure is to be

used to estimate current and projected profitability, some form of forecast of EDB's ROIs is required. The ENA considers the likely best basis for such forecasts, which is relatively low-cost to implement, is historic ROIs. To that end the ENA commissioned Peter Thomson and Tony van Zijl to develop a method for forecasting EDB ROIs and the associated standard deviation of the forecast error using the historic EDB ROI dataset. Their report, *A statistical forecasting framework and models for the determination of starting price adjustments for default price-quality paths*, 8 December 2010 (the 'ROI Forecasting Paper'), is attached.

5. The ROI Forecasting Paper examines a number of historic EDB ROI data sets ('scenarios') prepared by PwC (an attached report from PwC describes the basis for each scenario). The analysis in the ROI Forecasting Paper relies primarily on two scenarios: scenario 2 which takes all EDBs' ROIs for years ending 1999 – 2010 and replaces the periodic revaluations from 1999 – 2007 with revaluations based on the CPI; and scenario 5 which takes the EDBs' ROIs for the years ending 2005 – 2010 and adjusts them for the ROI specification used from 2008, plus removes the impact of any price threshold breaches and capital contributions. Scenario 2, as the longer series, is used to identify the statistical model that best fits the ROI data. The scenario 5 data is then used for estimation and forecasting, to provide indicative results (i.e. results we expect are a good indication of those the proposed method would produce when applied to ROIs calculated consistent with the draft input methodology specification). Note in all cases post-tax ROIs and WACC estimates are used, as this is basis on which ROIs have been reported to date.
6. It may be possible to refine this method by modifying ROI forecasts (based on historic ROIs) with EDB forecasts of expected changes in their cost structures in the upcoming regulatory period. This could apply, for example, where an EDB is entering a period of capital expenditure that is significantly higher than in the existing regulatory period. This possible refinement to the proposed method is not developed in this submission, as in this submission we focus on the aspect of deriving and applying ROI forecasts from the historic ROI data. This possible refinement could be viewed as moving the DPP starting price method closer to the CPP method, while ensuring it remains relatively low-cost.

#### **Identifying if a change in DPP starting prices is warranted**

7. The proposed method for forecasting non-exempt EDB ROIs, using the scenario 5 data, would result in the following approach to identifying whether an EDB should be required to reduce its DPP starting prices, or be permitted to increase its DPP starting prices:
  - Calculate the forecast ROI for each EDB, and the control limit. The forecast ROI would be unique to each EDB but the control limit would be common to all non-exempt EDBs. Using the scenario 5 data, the standard deviation of the forecast error is 0.83% (using the "local level model").

- The ROI Forecasting Paper recommends taking the “target ROI” (i.e., the WACC) plus at least 2 standard deviations of the forecast error to set the control limit such that the Commission could confidently conclude an EDB’s forecast ROI is inconsistent with the target ROI. Using the scenario 5 data, this would result in setting the control limit at the WACC plus 1.66% .
- An EDB with a forecast ROI in excess of the control limit would be required to lower its starting prices (or adopt a price glide-path) such that its forecast ROI is at the control limit.
- Consistency of treatment across EDBs argues that an EDB with a forecast ROI below the control limit should be able to raise its starting prices (or adopt a price glide-path) up to the point that its forecast ROI is equal to the control limit.

#### Calculating the extent of change to DPP starting prices

8. The extent of change in an EDB’s starting prices (expressed in terms of its allowable notional revenue as at the end of the regulatory period), in order to achieve a desired change in forecast ROI, could be calculated using the formula:

$$\frac{\Delta P}{P} = \frac{RAB(ROI_C - ROI_F)}{(X + D)(1 - t) + V + RAB \cdot ROI_F}$$

where

$RAB$  = regulatory asset base at the commencement of the next period

$ROI_C$  = return set at the control limit

$ROI_F$  = forecast return for the current period

$X$  = expected Opex

$D$  = expected depreciation

$t$  = tax rate

$V$  = revaluation

9. Once “ $RAB$ ” is estimated, “ $D$ ” and “ $V$ ” could be readily calculated as a function of  $RAB$ . The other variable that would need to be estimated in some way is “ $X$ ”.
10.  $RAB$  and  $X$  could be estimated in a number of ways with increasing sophistication and precision, along the following lines:

1. Take the *RAB* and *X* values from the most recent annual disclosures (i.e. in the normal course of events this would be from the 4<sup>th</sup> regulatory year). In practice this approach may require these disclosures to be reported earlier than the current 31 August in order to allow sufficient time for these reported values to be used in this calculation and for the Commission to consult appropriately on the results.
  2. Derive forecasts for the *RAB* value as at the end of the 5<sup>th</sup> regulatory year from capex spent in the first half of the 5<sup>th</sup> regulatory year and from the EDB's forecast for the remainder of the 5<sup>th</sup> regulatory year. Likewise *X* could be forecast for the 5<sup>th</sup> regulatory year from Opex spent in the first half of that year and the EDB's forecast of what will be spent in the remainder of that year.
  3. Take the forecasts of *RAB* and *X* in (2) above and modify the forecast *RAB* for additional capex expected to be incurred in the first year of the new regulatory period, and the forecast *X* for expected changes to Opex in that year relative to the 5<sup>th</sup> regulatory year.
11. Moving from the above approaches 1 to 2 to 3 would incur additional cost and complexity, but should also increase the precision of the forecast of each of these variables. The ENA would welcome an opportunity to discuss with the Commission the relative merits of each approach, including possible ways to provide the Commission sufficient comfort for each approach to be acceptable.

### **Key conclusions**

12. The data normalisation process and statistical analysis undertaken by PwC and Peter Thomson/Tony van Zijl (respectively) have demonstrated that it is feasible to establish a statistically robust method for making DPP starting price adjustments:
- the data normalisation process has generated a ROI dataset that has variability characteristics we expect to be similar to those of ROI data disclosed under the proposed input methodologies. Expected changes to ROI not included in the normalisation process (e.g. corrections to the *RAB*, and changes to the cost allocation and tax approaches) are likely to affect the level of ROIs but not their variability. This result makes it unnecessary to resort to proxies (such as operating cost variation) to measure ROI variability; and;
  - while the time series information is short, the availability of panel data has meant that statistical techniques can be applied. The analysis has generated results that are in-line with EDB's intuitive assessments of likely variability in ROIs.

## 1. Introduction

13. The Electricity Networks Association (ENA) provided an initial response on 10 September<sup>1</sup> to the Commerce Commission's (Commission) paper of 5 August titled "*Starting Price Adjustments for Default Price-Quality Paths Discussion Paper*" (DPP Discussion Paper). This submission builds on that initial submission, along with the attached papers "*Electricity Networks Association: Return on Investment Data*", by PwC, and, "*A statistical forecasting framework and models for the determination of starting price adjustments for default price-quality paths*" by Peter Thomson and Tony van Zijl (ROI Forecasting Paper). The submission is structured as follows:
- Section 2 sets out the legislative context for the task of adjusting DPP starting prices and interprets that context to provide principles to guide the development of a method for adjusting DPP starting prices.
  - Section 3 proposes a method to determine if a DPP starting price adjustment is warranted, based on the findings of the ROI Forecasting Paper.
  - Section 4 proposes a method to determine the extent of any adjustment to DPP starting prices, if an adjustment is warranted.
14. The ENA has submitted previously, and continues to hold the view, that the method for adjusting DPP starting prices should be determined by the Commission as an input methodology.<sup>2</sup> This submission does not reiterate the arguments for this view but the ENA considers the method proposed in this submission to adjust DPP starting prices could and should be articulated as an input methodology.

## 2. Legislative context

15. The legislative context for adjusting DPP starting prices includes the purpose of Part 4 and of its subpart 6 (default/customised price-quality regulation), and aspects of section 53P (resetting starting prices, rates of change, and quality standards). These sections are appended.
16. The legislative context and the requirements of good regulatory practice give rise to the following obligations on the Commission when designing and

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<sup>1</sup> *Submission on Method to Adjust DPP Starting Prices*, Electricity Networks Association, 10 September 2010

<sup>2</sup> The reasons for this view are set out in the ENA letter of 23 July 2010 headed *Starting price adjustment methodology*

implementing a method to adjust starting prices. The rationale for these obligations is set out in the ENA's submission "Submission 1 – Regulatory Framework" of 9 August 2010 (paragraphs 4 -7).

*First, the Commission must, in exercising its powers, produce an outcome which is consistent with that produced in workably competitive markets.*

*Secondly, the Commission must ensure that (a) to (d) of the purpose of Part 4 are achieved. The Commission must place more weight on incentives to innovate and invest than it did under Part 4A or the old Part 4. In the event that a tension arises between (a) and other subparagraphs (in particular, with (d)), the Commission must give priority to (a).*

*Thirdly, in the event that one or more input methodologies (or approaches to a particular input methodology) is available, the Commission must properly consider the range of alternatives and select that input methodology which best meets the purpose statement.*

*Finally, the Commission must act in a manner consistent with the principles of good regulatory practice. In particular, it must:*

- a. act in a manner consistent with past expectations;*
- b. produce input methodologies which are fit for purpose;*
- c. support its conclusions by reference to principled and sound reasoning;  
and*
- d. avoid acting in a manner which is retrospective.*

17. These obligations apply whether or not the method to adjust DPP starting prices is determined as an input methodology (which ENA considers it should be).
18. In addition to the above, the method to adjust DPP starting prices must be consistent with the purpose of the subpart that applies to DPPs (and CPPs), namely (section 53K):

*The purpose of default/customised price-quality regulation is to provide a relatively low-cost way of setting price-quality paths for suppliers of regulated goods or services...*

## **Principles to guide development of method**

19. The ENA considers the following principles provide the necessary guidance for the Commission to meet its above obligations when designing a method to adjust DPP starting prices. Any such method needs to:
  1. be a relatively low-cost way of setting the default price path;

2. promote outcomes consistent with those produced in workably competitive markets;
  3. ensure that (a) to (d) of the purpose of Part 4 are achieved, and in the event that a tension arises between (a) and other subparagraphs (in particular, with (d)), the Commission must give priority to (a);
  4. be that method, from the range of alternatives, that best meets the purpose statements; and
  5. be consistent with the principles of good regulatory practice.
20. A method to set a CPP, in contrast, would need to meet all the above principles but for the first one of being a relatively low cost method, as the purpose of the CPP is to allow:
- ... the opportunity for individual regulated suppliers to have alternative price-quality paths that better meet their particular circumstances.*
21. Thus the ENA considers the Commission has an obligation to develop a method for adjusting DPP starting prices that, when applied to each EDB, achieves principles 1 - 5 above.
22. The ENA considers the binding constraint in developing such a method can be expected to be principle 1, as it is conceivable a method could be developed that would enable all other principles to be achieved for all EDBs, but such a method may not be low cost. For example, the CPP method as set out in the draft IMs is designed to achieve principles 2 – 5 above, but it is not expected to be “relatively low-cost”.
23. Thus the method for adjusting DPP starting prices needs to be relatively low cost while at the same time meeting the above principles. The trade-offs inherent in the design of such a method are explored in section 3 below, culminating in a proposed method for identifying if a DPP starting price adjustment is warranted. This is followed in section 4 with a proposed method for determining the extent of any DPP price adjustment, should one be warranted.

### **3. Determining if a DPP starting price adjustment is warranted**

24. The Commission is obliged on the one hand to ensure EDBs have incentives to invest and to innovate (limb (a) of the purpose of Part 4) while also ensuring suppliers are limited in their ability to extract excessive profits (limb (d)). In addition, any adjusted DPP starting prices must be “*based on the current and projected profitability of each supplier*” (section 53P 3 (b)). The ROI Forecasting Paper develops a method for estimating current and projected

profitability by forecasting an EDB's ROI, based on a historic non-exempt EDB ROI dataset. Historic ROIs have been selected as the basis for these forecasts as we consider they are the best indicators of future ROIs that are readily available, and therefore can be used to achieve a relatively low-cost method. Note in all cases post-tax ROIs and WACC estimates have been used, as this is the basis on which ROIs have been reported to date.

25. It may be possible to refine this method by modifying the ROI forecasts (based on historic ROIs) with EDB forecasts of expected changes in their costs structures in the upcoming regulatory period. This could apply, for example, where an EDB is entering a period of capital expenditure that is significantly higher than in the existing regulatory period. This possible refinement to the proposed method is not developed in this submission, as in this submission we focus on the aspect of deriving and applying ROI forecasts from the historic ROI data. This possible refinement could be viewed as moving the DPP starting price method closer to the CPP method, while ensuring it remains relatively low-cost.
26. The issue of uncertainty in estimation of ROI, as addressed in the ROI Forecasting Paper, is similar but additional to the issue of uncertainty which arises in relation to the estimation of WACC (the 'target ROI'). In both cases the Commission is faced with making regulatory decisions in the face of uncertainty.
27. In the case of a CPP, where the "relatively low-cost" constraint does not apply, the Commission is able to lower the level of uncertainty in ROI forecasts by requiring the CPP applicant to provide forecasts on all components of the cost building block approach (which together make up an ROI forecast) with extensive information supporting those forecasts. Thus in the case of adjusting DPP starting prices there is an element of uncertainty in the ROI forecasts that can be mitigated to some extent in a CPP application.
28. The ROI Forecasting Paper shows how statistical methods can be applied to the historical ROI series to (i) derive a forecast of underlying ROI for each EDB, and (ii) where the forecast exceeds the target ROI, to check whether the margin (above the target ROI) is statistically significant for a given false positive rate. The margin is significant if the forecast ROI is greater than a control limit. This limit is common to all EDBs and is determined by the target ROI, the standard deviation of the common forecast error, and the specified false positive rate.
29. In the estimation of WACC (target ROI) over recent years the Commission has consistently ascribed to the view (as does the ENA) that the economic costs of error are asymmetrical, that is under-estimating WACC will impose greater

social costs than over-estimation. It expressed this view in the Draft IM Reasons Paper<sup>3</sup> as follows (paragraphs 6.2.32 - .34):

*The reason for the Commission adopting a cost of capital estimate that is above the mid-point for default/customised price-quality regulation, is that it considers the social costs associated with underestimation of the cost of capital in a regulatory setting, are likely to outweigh the short-term costs of overestimation. That is, the Commission is acknowledging that where there is potentially a trade-off between dynamic efficiency (i.e. incentives to invest) and static allocative efficiency (i.e. higher short-term pricing), the Commission will always favour outcomes that promote dynamic efficiency. The reason being that dynamic efficiency promotes investment over time and ensures the longer term supply of the service, which thereby promotes the long-term interests of consumers.*

*This is consistent with the purpose statement as it tries to get as close to a workably competitive market outcome as possible, whilst ensuring that the long-term interests of consumer are promoted.*

*In light of the purpose statement, the outcome where an estimate above the mid-point is taken when setting price-quality paths is potentially desirable as it recognises that the social costs of setting allowed rates of return too low (i.e. incentives for firms to undertake efficient investments will be distorted, which would be inconsistent with the long-term benefit of consumers) probably outweighs the costs of setting allowed rates too high (i.e. consumers will be charged prices that are above those of comparable products or services expected in workably competitive markets).*

30. This same asymmetry of economic effect applies when designing and implementing a method to adjust DPP starting prices. Therefore, the value of the control limit needs to be calibrated with respect to the probability that an EDB is required to adjust its DPP starting prices downward when in fact this is not warranted – the false positive rate.

### **Price reductions**

31. An unwarranted price reduction (i.e. a false positive) gives rise to the following costs that would not otherwise arise:
- an EDB reduces or stops what would otherwise be prudent investment in its network as the DPP prices will not deliver its shareholders an adequate return, and thus limb (a) of the purpose of Part 4 is not achieved, and, in practical terms, its quality of service diminishes; or

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<sup>3</sup> *Input Methodologies Electricity Distribution Services: Draft Reasons Paper*, Commerce Commission, 18 June 2010

- an EDB applies for a CPP, and incurs the considerable costs to itself and the Commission in doing so, in an instance where a CPP would not have been required if its underlying ROI had been identified correctly.
32. On the other hand, an EDB's underlying (but unknown) ROI may warrant a reduction in its DPP prices but its forecast ROI has not breached the control limit. In this instance an EDB is able to charge above that required to compensate it for its costs and to incentivise investment. However, as noted in the quote from the Commission at paragraph 29 above, such an outcome may have some allocative efficiency implications in the short term but would not impede dynamic efficiency in the sector (the latter being the more important).
  33. The ENA therefore proposes that for any EDB with a forecast ROI that exceeds the control limit that the EDB be required to lower its DPP starting prices such that its forecast ROI is at the control limit. A method for calculating the required change in prices is developed in section 4. As shown in the ROI Forecasting Paper, the probability of false positives depends on the choice of the number of standard deviations used to set the control limit over the target ROI. For one standard deviation the probability of false positives is 15.87%, if two standard deviations are used the probability is 2.28% and if three standard deviations are used the probability is 0.13% (see page 18 of the ROI Forecasting Paper). In practical terms, if four EDBs have ROI forecasts above the control limit, the probability that at least one of them is a false positive would be approximately 50% with one standard deviation, 9% with two standard deviations, and 0.5% with three standard deviations. The ROI Forecasting Paper recommends the use of two or more standard deviations in calculating the control limit; the ENA supports that view.
  34. Using the scenario 5 data for years ending 2006 – 2009 the ROI Forecasting Paper finds the standard deviation of the forecast error to be 0.83% (using the "local level model"). If two standard deviations are used to establish the control limit, the scenario 5 data results in a control limit set by the target ROI, plus 1.66%. We expect this margin of 1.66% to be a good indication of the result from this method if applied to historic ROIs reported consistent with the draft input methodologies, as the PwC adjustments to reported ROIs aim to account for most of sources of ROI *volatility* inherent in the draft input methodology specification of ROI. Note these adjustments do not take account of some changes in the *level* of ROI that will result from the implementation of the draft input methodologies (e.g. from corrections to the regulatory asset base, the shift to tax expense with deferred tax balance, and the introduction of possible cost allocations), but a shift in the overall level of ROI across the DPP will not affect the standard deviation values.

### Price increases

35. Having established a method for identifying when a reduction to DPP starting prices is warranted, using a control limit, we now turn to exploring what should

happen to the DPP starting prices of EDBs whose forecast ROI is below the control limit.

36. The ENA considers that the method of adjusting DPP starting prices should enable all EDBs, at the commencement of a regulatory period, to be able to earn the same expected return, taking into account the uncertainty of the measurement of that expected return. This consistency of approach across EDBs is adopted by the Commission in its approach to setting a common WACC (the target ROI) for all the EDBs, which abstracts from any economic differences that might apply between EDBs or the environments in which they operate. It would be inconsistent to on the one hand apply a common WACC to all EDBs and on the other have a DPP starting price adjustment method that did not reference all EDBs to the same level of expected returns (taking into account the uncertainty of the measurement of those expected returns). It follows that if an EDB has a forecast ROI less than the control limit, it should be permitted to adjust its DPP starting prices up to the point that its forecast ROI is at the control limit. At the control limit, all EDBs would be subject to the same probability of being required to apply for a CPP (or have to reduce investment to achieve adequate returns).
37. The ENA notes that this approach differs from that proposed in the DPP Discussion Paper, in which a “ROI band” approach is used. This ROI band is employed “*to allow for uncertainty in a point estimate of a supplier’s returns*” (paragraph 4.15). The ENA agrees that uncertainty in the measurement of current and projected profitability needs to be taken into account within any method. In the method proposed in this submission uncertainty is taken into account in a statistically secure manner by way of setting the control limit with reference to a false positive rate that is based on clearly understood costs and consequences.
38. The Commission notes in the DPP Discussion Paper that if current and expected profitability could be measured without uncertainty the ROI band would collapse to a point estimate (paragraph 4.15). In the proposed method, if the standard deviation of the forecast error reduces (e.g. from less volatility in reported ROIs), the margin between the target ROI and the control limit will also reduce, and at the limit the control limit would equal the target ROI. Thus the dynamic the Commission alludes to, of reducing uncertainty feeding through to a smaller allowance for uncertainty, is built into the proposed method.
39. We note the DPP regulatory regime employs a price cap (and not a price floor). It follows that for those EDBs with a forecast ROI less than the control limit they should be able to raise their prices to that limit, but should not be required to do so. Therefore, while EDBs with a forecast ROI greater than the control limit should be required to lower their starting prices, the other EDBs should have discretion as to extent to which they raise their prices, up to the point that their forecast ROI is at the control limit.

## 4. Determining the extent of any starting price adjustment

40. An EDB's revenues from regulated services are, under the current DPP, defined in terms of quantities and price, resulting in a weighted average price constraint. This pricing constraint is termed "allowable notional revenue" in the DPP Determination (clause 8.4) and uses quantities (for practical reasons) from the period two years prior to the regulatory period in which they are used, and prices from the current period.
41. The CPI – X function is applied to allowable notional revenue each year in order to maintain prices in real terms, less a X factor to reflect expected productivity gains. The ENA considers this same approach could be taken to adjust DPP starting prices. This would mean if a step change in starting prices is required, the percentage change (whether an increase or decrease) could be applied to the allowable notional revenue calculation applying at the end of the regulatory period. Alternatively a price glide-path could be applied in a similar manner.
42. The formula (see Appendix 2 for its derivation) for the required change in relative prices,  $\frac{\Delta P}{P}$ , is given by

$$\frac{\Delta P}{P} = \frac{RAB(ROI_C - ROI_F)}{(X + D)(1 - t) + V + RAB \cdot ROI_F}$$

where

$RAB$  = regulatory asset base at the commencement of the next period

$ROI_C$  = return set at the control limit

$ROI_F$  = forecast return for the current period

$X$  = expected Opex

$D$  = expected depreciation

$t$  = tax rate

$V$  = revaluation

43. Once " $RAB$ " is estimated, " $D$ " and " $V$ " can be readily calculated as a function of  $RAB$ . The other variable that needs to be estimated is " $X$ ".

44. *RAB* and *X* could be estimated in a number of ways with increasing sophistication and precision, along the following lines:
1. Take the *RAB* and *X* values from the most recent annual disclosures at the time when the DPP reset is being undertaken (i.e. in the normal course of events this would be from the 4th regulatory year). Note in practice this approach may require these disclosures to be reported earlier than the current 31 August in order to allow sufficient time for these reported values to be used in this calculation and for the Commission to consult appropriately on the results.
  2. Derive forecasts for the *RAB* value as at the end of the 5<sup>th</sup> regulatory year from capex spent in the first half of the 5<sup>th</sup> regulatory year and from the EDB's forecasts for the remainder of the 5<sup>th</sup> regulatory year. Likewise *X* could be forecast for the 5<sup>th</sup> regulatory year from Opex spent in the first half of the year and the EDB's forecast of what will be spent in the remainder of that year.
  3. Take the forecasts of *RAB* and Opex in (2) above and modify the forecast *RAB* for additional capex expected to be incurred in the first year of the new regulatory period, and the forecast Opex for expected changes to Opex in that year relative to the 5<sup>th</sup> regulatory year.
45. Moving from the above approach 1 to 2 to 3 in turn would incur additional cost and complexity. The ENA would welcome an opportunity to discuss with the Commission the relative merits of each approach and possible ways to provide the Commission sufficient comfort for each approach to be acceptable.

## **Appendix 1: Extracts from Part 4**

### ***52A Purpose of Part***

- (1) The purpose of this Part is to promote the long-term benefit of consumers in markets referred to in section 52 by promoting outcomes that are consistent with outcomes produced in competitive markets such that suppliers of regulated goods or services—*
- (a) have incentives to innovate and to invest, including in replacement, upgraded, and new assets; and*
  - (b) have incentives to improve efficiency and provide services at a quality that reflects consumer demands; and*
  - (c) share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices; and*
  - (d) are limited in their ability to extract excessive profits.*

### ***53K 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 or services, while allowing the opportunity for individual regulated suppliers to have alternative price-quality paths that better meet their particular circumstances.*

### ***53P Resetting starting prices, rates of change, and quality standards***

- (1) Before the end of the first and every subsequent regulatory period, the Commission must amend the section 52P determination by setting out the starting prices (as referred to in section 53O(a)), rates of change (as referred to in section 53O(b)), and quality standards (as referred to in section 53O(c)) that apply for the following regulatory period.*
- (2) In resetting starting prices, rates of change, and quality standards, the Commission must consult with interested parties.*
- (3) The starting prices must be either—*
- (a) the prices that applied at the end of the preceding regulatory period; or*
  - (b) prices, determined by the Commission, that are based on the current and projected profitability of each supplier.*
- (4) Starting prices set in accordance with subsection (3)(b) must not seek to recover any excessive profits made during any earlier period.*
- (5) Subject to subsection (8), the Commission must set only one rate of change per type of regulated goods or services (for example, if the rate of change (x) is 1% in a CPI-x path, 1% must be the rate for all goods or services of that type).*

- (6) The rate of change must be based on the long-run average productivity improvement rate achieved by either or both of suppliers in New Zealand, and suppliers in other comparable countries, of the relevant goods or services, using whatever measures of productivity the Commission considers appropriate.*
- (7) When setting the rate of change, the Commission may take into account the effects of inflation on the inputs of suppliers of the relevant goods or services.*
- (8) The Commission may set alternative rates of change for a particular supplier—*
- (a) as an alternative, in whole or in part, to the starting prices set under subsection (3)(b) if, in the Commission's opinion, this is necessary or desirable to minimise any undue financial hardship to the supplier or to minimise price shock to consumers; or*
- (b) as an incentive (under section 53M(2)) for the supplier to improve its quality of supply.*
- (9) Any alternative rates of change set under subsection (8) may include step changes.*
- (10) The Commission may not, for the purposes of this section, use comparative benchmarking on efficiency in order to set starting prices, rates of change, quality standards, or incentives to improve quality of supply.*
- (11) If starting prices, rates of change, and quality standards have not been set by way of an amendment to the relevant section 52P determination by the end of the regulatory period to which it applies, the starting prices, rates of change, and quality standards that apply at the end of the regulatory period continue to apply until the reset starting prices, rates of change, and quality standards are set.*

## Appendix 2: Calculation for change in prices

If prices for the next period are based on the forecast return for the current period,  $ROI_F$ , then the required pre-tax revenue,  $R_F$ , satisfies:

$$R_F = X + D + (R_F - X - D)t + V + RAB \cdot ROI_F$$

and so is given by

$$R_F = \frac{(X + D)(1 - t) + V + RAB \cdot ROI_F}{1 - t}$$

where

$X$  = expected Opex

$D$  = expected depreciation

$t$  = tax rate

$V$  = revaluation

$RAB$  = regulatory asset base at the commencement of the next period

However, with the DPP starting prices based on an expected return set at the control limit,  $ROI_C$ , the resulting change in the required pre-tax revenue,  $\Delta R$ , satisfies:

$$\Delta R = \Delta R \cdot t + RAB(ROI_C - ROI_F)$$

so that

$$\Delta R = \frac{RAB(ROI_C - ROI_F)}{1 - t}$$

Assuming that prices are strictly proportional to revenue, the implied relative change in prices,  $\frac{\Delta P}{P}$ , is now given by:

$$\frac{\Delta P}{P} = \frac{\Delta R}{R_F} = \frac{RAB(ROI_C - ROI_F)}{(X + D)(1 - t) + V + RAB \cdot ROI_F}$$