



COMMERCE COMMISSION

Initial Reset of the Default Price-Quality Path
for
Electricity Distribution Businesses

Draft Decisions Paper

Networks Performance Branch
Commerce Commission
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New Zealand

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EXECUTIVE SUMMARY

Background

- X1 As suppliers of electricity lines services, electricity distribution businesses (“EDBs”) are subject to default/customised price-quality regulation under Part 4 of the Commerce Act 1986 (“the Act”). EDBs are currently subject to a default price-quality path (“Initial DPP”) which the Commerce Commission (“the Commission”) must reset before its expiry on 31 March 2010. The DPP to apply from 1 April 2010 (“Reset DPP”) is applicable to all EDBs, except those defined as “consumer-owned” under section 54D of the Act.¹
- X2 This paper (“Draft Decisions Paper”) sets out the Commission’s draft decisions and current views on the Reset DPP. This paper is the fourth consultation paper released as part of the overall process to reset the Initial DPP. The Commission has considered submissions from each of the three previous consultation papers in reaching its draft decisions.

Scope

- X3 The scope of the Draft Decisions Paper has been limited to elements of the Reset DPP that will be specified in the section 52P determination to be published circa 1 December 2009 (“Initial Reset Determination”). These elements include:
- the structure of the Reset DPP;
 - the starting prices to be used under the price-path;
 - a rate of change to apply under the Reset DPP;
 - quality standards to apply under the Reset DPP; and
 - the proposed structure and content of the Initial Reset Determination.
- X4 Consistent with this, the Draft Decisions Paper does not address all matters relevant to the Reset DPP (e.g., the methodology and information requirements for starting price adjustment are not covered). The Commission intends to address such matters and amend the Initial Reset Determination following the publication of input methodology determinations. Summaries of the main draft decisions and related views within this paper are set out under the relevant headings below.
- X5 The Commission notes that views presented below and in this paper are draft decisions and do not represent its final decisions.

¹ The Commission set out its treatment of consumer-owned EDBs under the Initial DPP, including interpretation of section 54(D), in its paper Treatment of Consumer-owned Electricity Distribution Businesses under the Initial Default Price-Quality Path, published on 11 August 2009. The Commission will use this interpretation of section 54(D) when determining which EDBs are “consumer-owned” under the Reset DPP.

Framework

- X6 The Commission's draft decisions in this paper have been reached following consideration of both the overall regulatory purpose statement of Part 4 and the specific purpose statement for default/customised price-quality regulation. In addition to this, relevant Government Policy Statements and a number of other considerations have also been taken into account.

Energy Efficiency and Demand-side Management

- X7 The Commission considers that there are potential initiatives available to EDBs to influence energy efficiency and related outcomes that may be consistent with the Part 4 Purpose, but notes that incorporating such mechanisms within a DPP will be complex. The Commission considers that by providing EDBs with the flexibility to adjust pricing structures under the price-path, the Commission is promoting incentives and, in particular, avoiding disincentives to the promotion of energy efficiency.
- X8 It is the Commission's view that, primarily due to time constraints, it will not be feasible to implement a dedicated and robust energy efficiency mechanism as part of the Reset DPP. However, the Commission will continue to engage with interested parties on the matter and intends to begin a consultation process in early 2010.

Form of the Default Price-Quality Path

- X9 The regulatory provisions relating to the form of a DPP are relatively prescriptive. However some elements, including a number relating to the Reset DPP, are not defined. The Commission's draft decisions relating to a number of these are set out below:
- the Commission will give effect to the Reset DPP using a single determination;
 - the Reset DPP will incorporate separately defined and assessed price and quality paths;
 - for the purposes of defining and assessing compliance against the price-path, the Commission will use a form of 'notional revenue'; and
 - the Reset DPP will apply for a regulatory period of five years (i.e., 1 April 2010 to 31 March 2015).

Starting Prices

- X10 In order to set appropriate prices for EDBs, the Commission considers that starting price adjustments will—in general—be appropriate. However, in the absence of input methodology determinations, the Commission’s draft decision is to specify starting prices² as those that applied at the end of the preceding regulatory period, i.e. those that will apply on 31 March 2010. Further decisions on starting price adjustments will be made, as soon as practicable, after the publication of the input methodology determinations.

Rate of Change

- X11 The Commission’s draft decision is that it is appropriate for the Reset DPP price-path to be indexed using a CPI-X mechanism and that a single rate of change should be applied to all EDBs. The Commission’s draft decision is that the X-factor will be set at 0% per annum. The Commission notes that its proposed X-factor is within the ranges recommended by both Economic Insights and Pacific Economics Group.

Quality Standards

- X12 The Commission’s draft decision is to set quality standards based on reliability performance that seek to promote an outcome of ‘no material deterioration’. To achieve this, the Commission will set SAIDI and SAIFI targets based on a five-year historic average calculated for the period 2005-2009 inclusive. The Commission will employ the IEEE Standard and dead-bands to account for extreme and normal variability respectively.
- X13 The Commission’s draft decision is that compliance against the quality path will be assessed using a multi-year assessment scheme (“two of three rule”). Under this, an EDB will be required to comply with its reliability target for no less than two out of three consecutive years.

Next Steps

- X14 Submissions are invited on this Draft Decisions Paper and should be received by the Commission no later than 11am Monday, 12 October 2009. The Commission will consider these submissions when publishing an Updated Draft Decisions Paper, scheduled for release in November 2009.

² The Commission proposes that the price-path of an EDB will be based on its starting price and rate of change. The Reset DPP price-path will allow actual (weighted average) prices to be set above the starting price of the price-path, subject to the overall CPI-X constraint. The role of starting prices when assessing price-path compliance is discussed further in paragraph 4.81.

SECTION 1: OVERVIEW

CHAPTER 1: INTRODUCTION

1.1 Default/Customised Price-Quality Regulation

- 1.1 As suppliers of electricity lines services, electricity distribution businesses (“EDBs”)³ are subject to the regulatory provisions under Part 4 of the Commerce Act 1986 (“the Act”). Subpart 9 of Part 4 provides that EDBs are subject to default/customised price-quality regulation. The Act also provides that consumer-owned EDBs, as defined in section 54D of the Act, are exempt from this type of regulation.⁴
- 1.2 Default/customised price-quality regulation has replaced the targeted control regime that previously applied to EDBs under the repealed Part 4A thresholds regime (“Thresholds”). The main features of default/customised price-quality regulation include:
- a default price-quality path (“DPP”), which is a default set of regulatory provisions applying to suppliers. The DPP provides a “relatively low cost way”⁵ of setting price-quality regulation;
 - the ability for individual suppliers to make proposals to the Commission for a customised price-quality path (“CPP”) that better meets the supplier’s particular circumstances; and
 - penalty provisions for breaches of price-quality paths.
- 1.3 The Act provides that default/customised price-quality regulation applies to EDBs from 1 April 2009. For the period 1 April 2009 to 31 March 2010, the thresholds⁶ set under Part 4A were deemed to be section 52P determinations that apply to EDBs as if they were the initial default price-quality paths (“Initial DPP”). Under section 54K(1), the Commission is required to reset the Initial DPP before 1 April 2010 using a section 52P determination (“Determination”), a summary of which is to be published by 1 December 2009.⁷ This section 52P determination will give effect to the default price-quality paths that will apply from 1 April 2010 to 31 March 2015 (“Reset DPP”). The Determination to be published in

³ For the purposes of this Draft Decisions Paper, references to EDBs only indicate those subject to default/customised price-quality regulation, unless explicitly stated otherwise.

⁴ supra n 1.

⁵ *Commerce Act 1986*, section 53K.

⁶ As specified in the *Commerce Act (Electricity Distribution Thresholds) Notice 2004*.

⁷ Under section 53M(7), no DPP applies until the commencement date in the Determination, which must be at least four months following a summary of the Determination being published in the *New Zealand Gazette* (“Gazette”).

December 2009 is referred to in this paper as the “Initial Reset Determination”.

1.2 Scope of Paper

Overview

- 1.4 The purpose of this paper (“Draft Decisions Paper”) is to set out the Commission’s draft decisions and current views on the Reset DPP. These draft decisions and views build on those previously expressed by the Commission as part of the Reset DPP process. In developing the views contained in this paper, the Commission has considered submissions at each stage of the process.
- 1.5 The Commission’s views presented within this paper are draft decisions only and do not represent the Commission’s final decisions. The Commission intends to refine and where necessary reconsider its views on the issues addressed in this paper in light of submissions received and further analysis. One particular area for further consideration is the form and content of the Initial Reset Determination, discussed in Chapter 8.

Draft Decisions and Future Work

- 1.6 Many of the matters to be covered by input methodologies are of relevance to the Reset DPP. However, input methodology determinations will be published after the Reset DPP takes effect. The Reset DPP will likely be of a transitional nature as an amendment to the Initial Reset Determination is likely to be required after input methodology determinations are published, in order to reflect relevant decisions in those determinations. The Commission will endeavour to ensure this transition is smooth for EDBs and, where practicable, will make decisions that will be consistent across the regulatory period.
- 1.7 The Commission has focussed the Draft Decisions Paper on elements of the Reset DPP that will be specified in the Initial Reset Determination. Consistent with this, the Commission has made draft decisions on the following matters:
- *Form of Price-Path*: the structure and content of the price-path is set out in Chapter 4;
 - *Starting Prices*: both the starting prices to apply on 1 April 2010 and the timing of starting price adjustments under the Reset DPP are set out in Chapter 5;
 - *Rate of Change*: a rate of change (“X-factor”)⁸ to apply under the Reset DPP is proposed in Chapter 6;

⁸ The Commission has adopted the term X-factor to represent the ‘X’ component of the CPI-X indexation component of the price-path. The overall rate of change in weighted average prices under the DPP is, however, in practice CPI-X%. This distinction is discussed further in Chapter 6.

- *Quality Standards*: quality standards to apply under the Reset DPP are set out in Chapter 7; and
- *Form of Determination*: the proposed structure and content of the Initial Reset Determination is set out in Chapter 8.

Future Work

1.8 A number of issues relevant to the Reset DPP will not be directly addressed in the Initial Reset Determination. The Commission proposes that such areas will be addressed during the early stages of the Reset DPP, taking into account input methodology determinations, where relevant. In view of the restricted timelines and in the absence of finalised input methodology determinations, the Draft Decisions Paper does not address these in detail. Following respective consultation processes these issues may be addressed, if appropriate, in an amended Determination as is provided for under the Act.⁹ The Commission proposes to undertake further consultation on the following issues:

- *Starting Price Adjustments*: the methodology for making starting price adjustments including proposals for assessing current and projected profitability (an indicative timetable is set out in 5.33);
- *Claw-back*: the methodology for the potential implementation of claw-back including the circumstances in which it should be applied;
- *Energy Efficiency Mechanisms*: consideration of a dedicated mechanism that may further promote energy efficiency and would be suitable under a DPP. Views on previous submissions and the timing of further work is discussed in Chapter 3;
- *S-factor Mechanism*: consideration and development of possible mechanisms explicitly linking price and quality under a DPP; and
- *Enforcement Guidelines*: the Commission's approach to compliance and enforcement matters arising from Part 4, including steps the Commission would take before any court action might eventuate. The Commission expects to consult with interested parties in 2010 regarding the development of these guidelines.

1.9 The Commission acknowledges the submissions it has received on the above matters and would like to express its appreciation to the submitting parties for their constructive comments. The Commission intends to use this material to help inform its further work in these areas.

⁹ Section 52Q sets out the process for amending a Determination, while section 52P(4) states that different parts of a Determination may come into effect at different times.

Structure of paper

1.10 The chapters and appendices that make up the Draft Decisions Paper are set out in the following table.

Table 1 Chapter Overview

Section 1	Overview
Chapter 1	Introduction Discusses the scope and overall structure of the paper.
Section 2	Framework
Chapter 2	Purpose and Principles Discusses the Part 4 Purpose and related principles.
Chapter 3	Considerations for the Reset DPP Discusses additional statutory requirements relating to DPPs.
Section 3	Draft Decisions
Chapter 4	Price-Path Draft decisions on the form of the price-path and its assessment.
Chapter 5	Starting Prices Draft decisions on the specification of starting prices for EDBs.
Chapter 6	Rate of Change Draft decisions on the level of the X-factor.
Chapter 7	Quality Standards Draft decisions on quality standards and their assessment.
Section 4	Form of the Determination
Chapter 8	Initial Reset Determination Discusses the overall form and content of the Determination.
Section 5:	Appendices
Appendix A	Glossary Defines terms used in the paper.
Appendix B	Price-Path Formulae Sets out the proposed price-path formulae with worked examples.
Appendix C	Quality Standards Sets out further detail on the implementation of the quality-path.

1.3 Decision Process

1.11 This section outlines the remainder of the Commission's proposed process for implementing the Reset DPP. The Commission intends that this process should deliver the following outputs¹⁰ by 1 December 2009¹¹:

- a **Final Decisions Paper** that provides detailed background to, and analysis of, the decisions included in the Initial Reset Determination;
- the **Initial Reset Determination** that sets how default/customised price-quality regulation applies to EDBs; and
- a **Summary of the Initial Reset Determination** to be published in the Gazette.

Process to Date

1.12 The Commission has previously conducted three consultation processes, published three papers and commissioned two research reports relevant to the DPP reset process. The papers published to date are as follows:

- *Regulatory Provisions of the Commerce Act 1986 – Discussion Paper* (“Provisions Paper”), published on 19 December 2008;
- *Reset of Default Price-quality Path for Electricity Distribution Businesses – Process and Issues Paper* (“Process Paper”) published on 30 March 2009;
- *Reset of Default Price-quality Path for Electricity Distribution Businesses – Discussion Paper*, (“Discussion Paper”) published on 19 June 2009. This paper was accompanied by two research reports from Economic Insights:
 - *Asset Valuation and Productivity-based Regulation taking account of Sunk Costs and Financial Capital Maintenance*; and
 - *The Theory of Network Regulation in the Presence of Sunk Costs*.

1.13 This Draft Decisions Paper is the fourth consultation paper released by the Commission as part of the Reset DPP process. This paper is subject to a five week consultation period, to be followed by a two week cross-submission period in which parties may provide comment on the views expressed by other parties.¹²

¹⁰ The Commission notes that the statutory deadline refers only to the summary of the Determination.

¹¹ The Commission notes Vector Limited's (“Vector”) submission on this matter, which stated it will be necessary that “...the summary of the decision contains sufficient information for EDBs to comply with the price-cap. Alternatively, and preferably, the Commission would publish the full determination on the same day as the summary.” Vector, *Submission to Commerce Commission on Electricity Default Price-Quality Path Discussion Paper*, 17 July 2009, paragraph 21.

¹² Consultation lengths may vary slightly.

Remaining Steps

- 1.14 Prior to publishing the Summary of the Initial Reset Determination, the Initial Reset Determination and the Final Decisions Paper, the Commission proposes to undertake the following steps.
- Publication of an **Updated Decisions Paper** in mid-November reflecting submissions and cross-submissions to the Draft Decisions Paper.
 - Accompanying the Updated Decisions Paper will be a **Draft Initial Reset Determination** setting out the Commission's proposed content for the determination giving effect to the Reset DPP.¹³
 - Following their publication, these papers will be subject to a technical drafting consultation period (one week) during which parties may comment on the structure and content of the Draft Determination.

1.4 Submissions

- 1.15 Submissions are invited on this Draft Decisions Paper and should be received by the Commission no later than 11am Monday, 12 October 2009 ("first due date"). The Commission invites cross-submissions on matters raised in submissions to the Draft Decisions Paper. The purpose of cross-submissions is to ensure that the Commission is aware of points of agreement or disagreement on matters raised by other submitters. The Commission therefore asks that parties providing cross-submissions focus their cross-submissions in this way. The Commission expects that cross-submissions should be no more than five pages long. Cross submissions should be received by the Commission no later than 1pm Monday, 26 October 2009 ("second due date"). All submissions and cross-submissions should be supported by documentation and evidence, where appropriate.
- 1.16 In order to meet the timeframe prescribed in the Act, the Commission will rely on submissions being provided in accordance with both due dates. As such, the Commission does not intend to provide extensions beyond the due dates. The Commission may not be in a position to adequately consider submissions if received after either of the due dates.
- 1.17 To foster an informed and transparent process, the Commission intends to publish all submissions (on the first due date) and subsequent cross submissions on its website. Accordingly, the Commission requests an electronic copy of each submission and requests that hard copies of submissions not be provided (unless an electronic copy is not available). The Commission also requires that these electronic copies be provided in an accessible form (i.e., they are 'unlocked' and text can be easily transferred).

¹³ The Commission may publish a draft of the Initial Reset Determination prior to this time for a separate short consultation. Submissions on this Draft Decisions Paper will inform whether this is appropriate.

If the submission contains confidential information or if the submitter wishes that the published version be 'locked', an additional document labelled "public version" should be provided. Submissions should be sent to:

NPB@comcom.govt.nz;

or

David Healy
Chief Adviser
Network Performance Branch
Commerce Commission
P.O. Box 2351
Wellington

Confidentiality

- 1.18 The Commission discourages requests for non-disclosure of submissions, in whole or in part, as it is desirable to test all information in a fully public way. It is unlikely to agree to any requests that submissions in their entirety remain confidential. However, the Commission recognises that there will be cases where interested parties making submissions may wish to provide confidential information to the Commission.
- 1.19 If it is necessary to include such material in a submission the information should be clearly marked and preferably included in an appendix to the submission. Interested parties should provide the Commission with both confidential and public versions of their submissions. The responsibility for ensuring that confidential information is not included in a public version of a submission rests entirely with the party making the submission.
- 1.20 Parties can request that the Commission makes orders under section 100 of the Act in respect of information that should not be made public. Any request for a section 100 order must be made when the relevant information is supplied to the Commission and must identify the reasons why the relevant information should not be made public. The Commission will provide further information on section 100 orders if requested by parties, including the principles that are applied when considering requests for such orders. 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 section 100 order will apply for a limited time only as specified in the order. Once an order expires, the Commission will follow its usual process in response to any request for information under the Official Information Act 1982.

SECTION 2: FRAMEWORK

CHAPTER 2: PURPOSE AND PRINCIPLES

2.1 Introduction

2.1 This chapter sets out the Commission's interpretation of the purpose of Part 4 of the Act ("Part 4 Purpose") and the purpose of default/customised price-quality regulation. The Commission has sought to promote these purposes in its draft decisions on the Reset DPP. The chapter also sets out the Commission's views on the economic principles arising from the Part 4 Purpose and implementation principles relating to the Commission's decision making under Part 4. The Commission has been guided by these principles in making its draft decisions on the Reset DPP.

2.2 Part 4 Purpose Statement

2.2 Section 52A states that the purpose of Part 4 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.*

Commission's Interpretation of Part 4 Purpose

2.3 The Commission's interpretation of the Part 4 Purpose is as follows:

- first, there is the central purpose, to promote the long-term benefit of consumers in markets where there is little or no competition and little or no likelihood of a substantial increase in competition; and
- second, there is the means of achieving that purpose, by promoting outcomes that are consistent with those produced in competitive markets. In particular, these outcomes must be such that suppliers of regulated goods or services:
 - have incentives to innovate and invest, including in replacement, upgraded, and new assets;
 - have incentives to improve efficiency and provide services at a quality that reflects consumer demands;
 - share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices; and
 - are limited in their ability to extract excessive profits.

- 2.4 In seeking to promote the long-term benefit of consumers through its decisions on the Reset DPP, the Commission has considered the inter-relationships between the objectives of section 52A(a)-(d).

Definition of Consumer

- 2.5 Given that the purpose of Part 4 is to promote the long-term benefit of consumers, it is important to have clarity as to which “consumers” are relevant. With respect to electricity lines services, section 54C(4) provides that “consumer” has the same meaning as in section 2(1) of the Electricity Act 1992—i.e., any person who is supplied, or who applies to be supplied, with electricity, this does not include:
- any electricity generator (i.e., any person who owns or operates a generator connected to distribution or transmission line);
 - any electricity distributor (i.e., any person who supplies line function services to any other person or persons);
 - any electricity retailer (i.e., any person who supplies electricity to another person or other persons for any purpose other than for resupply by the other person or persons);
 - except where the electricity generator or—as the case may be—the electricity distributor or electricity retailer is supplied, or applies to be supplied, with electricity for its own consumption and not for the purposes of re-supply to any other person.
- 2.6 Given that intermediaries such as generators, distributors and retailers are expressly excluded from the definition of consumer (unless they are supplied with electricity for their own consumption), the Commission considers that consumer means the individual or entity that consumes the electricity—i.e., the end-user.

Submissions on the Commission’s Interpretation¹⁴

- 2.7 The majority of submissions to the Discussion Paper either supported or did not comment specifically on the Commission’s interpretation of the Part 4 Purpose. Powerco Limited (“Powerco”), however, commented “the Commission’s primary question should be whether its decisions are consistent with outcomes produced in workably competitive markets. If the Commission achieves this objective, the outcomes in (a)-(d) will have been met.”¹⁵

¹⁴ The Commission has considered submissions to the Discussion Paper relating to the Commission’s interpretation of the Part 4 Purpose. Submissions that relate to its interpretation have also been received under the input methodologies process. These will be considered further during the input methodology conference process and relevant considerations for the Reset DPP will be addressed in the Updated Decisions Paper.

¹⁵ Powerco, *Reset of Default Price-Quality Path for Electricity Distribution Businesses, Discussion Paper*, 17 July 2009, paragraphs 12-13.

2.8 The Commission considers that section 52A(a)-(d) reflects key regulatory objectives. Actual workably competitive outcomes cannot be directly achieved or observed in a market where workable competition is absent or limited. If these objectives are achieved, then outcomes consistent with those in workably competitive markets can be considered to be likely to be achieved. These outcomes include improved efficiency (including through efficient investment and innovation), services provided at a quality that reflect consumer demands, efficiency gains shared with consumers through lower prices (than otherwise would be), and suppliers' profits being limited so they are not excessive. The Commission is required to promote all of the regulatory objectives and so must be mindful of any potential negative impacts that an over-emphasis on one may have on the promotion of others. The Commission may need to exercise its regulatory discretion and determine the appropriate weight afforded to each of these regulatory objectives when making decisions on the Reset DPP in order to promote the long-term benefit of consumers.

2.3 Purpose of Default/Customised Price-Quality Regulation

2.9 In addition to the Part 4 Purpose, section 53K provides that the purpose of default/customised price-quality regulation ("Section 53K Purpose") 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.

2.10 In the Commission's view, the DPP should be a generic tool under which price-quality regulation can be effectively applied across multiple suppliers within a sector. The Commission also considers that a DPP should, as far as is reasonably practicable, be straightforward to define, apply and to comply with. The second part of the Section 53K Purpose relates to the ability of suppliers to make a proposal for a CPP as an alternative to the DPP. It is likely that a CPP will better meet the particular circumstances of an individual EDB.

2.11 The Commission has sought to use readily available information when developing its draft decisions on the Reset DPP. This includes the use of previous analytical work and data collected under the Thresholds, where relevant. This approach is likely to promote the Section 53K Purpose by limiting costs imposed on both suppliers and the Commission when developing and implementing the Reset DPP. The Commission has carefully reviewed the relevance of previous analytical work in light of the Part 4 Purpose.

2.12 In making its draft decisions on the Reset DPP, the Commission has considered the Section 53K Purpose in addition to the Part 4 Purpose.

2.4 Regulatory Framework Principles

- 2.13 In its Discussion Paper, the Commission identified and discussed economic and implementation principles that would assist its consideration of various options for giving effect to the legislation and, in particular, in promoting the regulatory objectives in the Part 4 Purpose.¹⁶
- 2.14 The economic principles stem from the three dimensions of economic efficiency—allocative, productive and dynamic efficiency.¹⁷ These three dimensions are discussed further in paragraphs 2.32-2.45. They are intended to ensure that consumers benefit in the long-term from more efficient outcomes, just as they usually do under conditions of workable competition. This is discussed further in paragraphs 2.28-2.31.
- 2.15 In addition, the Commission has also sought to ensure that its decision making is consistent with relevant implementation principles, i.e., consistency, transparency, flexibility and cost-effectiveness. The implementation principles are discussed further in paragraphs 2.50-2.55 below.

Submissions on Regulatory Framework Principles

- 2.16 The chapter now considers relevant submissions received on the regulatory framework principles, i.e., the economic and implementation principles. These submissions have been considered by the Commission and have been taken into account when determining the principles outlined below in paragraphs 2.27-2.55.
- 2.17 Submissions were generally supportive of the economic and implementation principles proposed in the Discussion Paper. Submissions commented on the interrelationship between the principles, the weighting accorded to the principles, and suggested additional principles.
- 2.18 Submissions presented a spectrum of views on the interrelationship of the principles and how the principles should be considered in the Commission's decision-making. For example, the Electricity Networks Association ("ENA") commented that "[t]he economic principles must be considered alongside the implementation principles of flexibility, transparency, cost effectiveness and consistency and the overall objective of promoting regulatory certainty."¹⁸ Aurora Energy Limited ("Aurora") contended that

¹⁶ Commerce Commission, *Reset of Default Price-quality Path for Electricity Distribution Businesses – Discussion Paper*, 19 June 2009, pp. 7-17.

¹⁷ This is consistent with previous regulatory decisions made by the Commission, e.g., Commerce Commission, *Authorisation for the Control of Supply of Natural Gas Distribution Services by Powerco Ltd and Vector Ltd*, 30 October 2008, pp. 33-42.

¹⁸ ENA, *Submission on the Reset of the DPP for Electricity Distribution Business*, 17 July 2009, p. 17.

the Commission should have greater regard to its implementation principles rather than its economic principles.¹⁹

- 2.19 Submissions also commented on the weighting afforded to the different types of economic efficiency. For example, Aurora commented that the Commission has a tendency to pursue allocative efficiency over other forms of economic efficiency “rather than being motivated by providing ongoing incentives to achieve greater efficiency which is in the long-term interest of consumers”.²⁰ In their submission, Orion New Zealand Limited (“Orion”) commented that “[t]o the extent that Commission decisions consider the relative merits of the various types of efficiency it should give greatest weight to dynamic efficiency.”²¹ A common topic in submissions was the treatment of efficiency gains. For instance, Powerco commented “[t]he DPP reset is an opportunity for the Commission to send a clear and simple signal to EDBs that they can take steps to innovate and become more dynamically efficient as there will be clarity on the treatment of abnormal profits.”²²
- 2.20 Submitters suggested that the Commission consider adopting the following additional principles in relation to its decision-making:
- a) what happens in the competitive sector;²³
 - b) regulatory commitment;²⁴
 - c) robustness;²⁵ and
 - d) regulatory confidence and certainty.²⁶
- 2.21 The Commission is of the view that the essence of these proposed additional principles is sufficiently captured by the existing set of economic and implementation principles, as discussed in paragraphs 2.22-2.25 below.
- 2.22 Workable competition, discussed in paragraphs 2.28-2.31, provides incentives for market participants to act in ways that are efficient, for a given level of service quality, while ensuring that efficiency gains are shared with consumers over time. In addition, firms in workably competitive markets are limited in their ability to earn excessive profits, but superior performance will be rewarded with profits above normal levels over the short to medium term, prior to potential starting price adjustments.

¹⁹ Aurora, *supra* n 19, p. 8.

²⁰ *ibid.*

²¹ Orion, *Submission on Reset of Default Price-Quality Path for Electricity Distribution Businesses*, 17 July 2009, p. 2.

²² Powerco, *supra* n 15, paragraphs 30-31.

²³ Aurora, *supra* n 19, p. 7.

²⁴ Vector, *supra* n 11, paragraph 16.

²⁵ *ibid.*, paragraph 18.

²⁶ *ibid.*, paragraph 19.

- 2.23 Under a DPP, the price-path will be set so as to limit the ability of firms to extract excessive profits. The path will allow EDBs to recover their reasonable costs and will allow those that achieve superior performance to earn above normal profits for a period. This is consistent with the proposed principle of “what happens in the competitive sector”.
- 2.24 “Regulatory commitment” and the notion that “regulators should not lightly depart from their previous decisions”²⁷ is embraced by the *Consistency Principle* (discussed in paragraph 2.51). The Commission’s aim, to the extent practicable, is to be consistent in its decision-making. The *Consistency Principle* also reflects the proposed “regulatory confidence and certainty” principle, which requires that “the actions that a regulator takes over time should enhance the credibility of the regulatory regime, thereby promoting confidence to invest.”²⁸
- 2.25 Vector Limited (“Vector”) proposed that “robustness” be included as an implementation principle, such that “[t]he regulatory approaches that apply should derive from accepted economic theories or, where relevant, have a reliable statistical basis.”²⁹ The Commission bases its decisions on sound analytics within the constraints of the resources and information available and also the scope of the relevant mechanism. In the Commission’s view, the *Transparency* (discussed in paragraph 2.55) and *Consistency Principles* address the need for a “robustness” principle to a sufficient extent.
- 2.26 In the Commission’s view, submissions received were, in general, consistent with the Commission’s interpretation of the Part 4 Purpose and the regulatory principles that underpin this purpose. The Commission acknowledges that there is potential for diverging views when applying principles to its decision-making process, particularly where there may be a need to balance these principles. From time to time such balancing may result in trade-offs being made, which will require the Commission to exercise its discretion. Discussion on how these principles are applied, to the extent they are relevant to specific decisions, is incorporated throughout this paper.

Economic Principles

- 2.27 The Commission considers that the promotion of the economic principles listed below will assist in promoting the Part 4 Purpose. These principles stem from the three dimensions of economic efficiency. They form an important part of promoting the long-term benefit of consumers because they promote outcomes consistent with a standard of workable competition. The economic principles are to:
- promote *allocative efficiency*, subject to the opportunity for regulated businesses to earn normal returns (paragraphs 2.32-2.34);

²⁷ *ibid*, paragraph 16.

²⁸ *ibid*, paragraph 19.

²⁹ *ibid*, paragraph 18.

- promote realistic and achievable gains in *productive efficiency* (paragraphs 2.35-2.38); and
- promote *dynamic efficiency* by incentivising efficient investment (paragraphs 2.39-2.45).

The Standard of Workable Competition

2.28 The standard of competition that underpins Part 4 (and other parts of the Act) is that of “workable or effective” competition (hereafter “workable competition”).³⁰ Workable competition tends to reflect a view that competitive behaviour is a dynamic process—one that emerges from the rivalry of market participants. Under workable competition, the incentive for firms to improve efficiency and actively seek out opportunities for innovation is provided by the potential to earn a positive economic profit. Profits tend toward normal economic returns over time, with the expectation that they will be sufficient to cover efficiently incurred costs and reward innovation, prudent investment and efficiency gains.

2.29 The following formulation of workable competition was approved by the New Zealand High Court in *Fisher & Paykel Ltd v Commerce Commission*:

Workable competition means a market framework in which the presence of other participants (or the existence of potential new entrants) is sufficient to ensure that each participant is constrained to act efficiently and in its planning to take account of those other participants or likely entrants as unknown quantities. To that end there must be an opportunity for each participant or new entrant to achieve an equal footing with the efficient participants in the market by having equivalent access to the means of entry, sources of supply, outlets for product, information, expertise and finance. This is not to say that particular instances of the items on that list must be available to all. That would be impossible. For example, a particular customer is not at any one time freely available to all suppliers. Workable competition exists when there is an opportunity for sufficient influences to exist in any one market, which must be taken into account by each participant and which constrain its behaviour.³¹

2.30 Workable competition provides incentives for market participants to act in ways that are efficient, for a given level of service quality, while ensuring that efficiency gains are shared with consumers over time. In addition, firms are limited in their ability to earn excessive profits, but superior performance will be rewarded with profits above normal levels over the short to medium term, creating/providing incentives to invest and innovate.

2.31 Although regulation is unable to replicate workably competitive market outcomes, the regulatory instruments provided for in Part 4 of the Act are intended to provide incentives for improvements across the three dimensions of efficiency and to promote the associated objectives specified in

³⁰ Section 3(1) of the Act states that in this Act, competition means workable or effective competition.

³¹ *Fisher & Paykel Ltd v Commerce Commission*, [1990] 2 NZLR 731 citing, Heydon, Trade Practices Law (2nd ed, 1989) Vol 1, p. 1548, paragraph 3.210.

subsections (a) through (d) of the Part 4 Purpose. To the extent practicable, given the particular type being applied, regulation is intended to promote outcomes that are more consistent with the outcomes produced in competitive markets than would otherwise be the case without regulation. By doing so, regulation is ultimately intended to promote the long-term benefit of consumers.

Promoting Allocative Efficiency

- 2.32 Section 52A(1)(b) of the Act refers to incentives for suppliers of regulated services to improve “efficiency” and provide services at a quality that reflects consumer demands. The Commission considers that the reference to efficiency in section 52A(1)(b) encompasses all three dimensions of economic efficiency.
- 2.33 In respect of allocative efficiency, a key feature of workably competitive markets is that they tend to allocate resources to their most valuable uses within the economy (i.e., their value over and above their opportunity cost). This implies that pricing efficiency is a desirable goal of regulation, as this is the mechanism that conveys the relative value of various goods and services throughout society. Prices that are closer to the long-run marginal costs of supplying services at the requisite quality will increase allocative efficiency, overall welfare and the long-term benefit of consumers, thereby promoting the Part 4 Purpose.
- 2.34 Where there are substantial economies of scale and/or scope, marginal cost pricing is unlikely to yield sufficient revenue to recover the efficiently incurred costs of production. Where such tensions exist, the Commission has in the course of regulatory proceedings consistently given weight to dynamic efficiency considerations when promoting the long-term benefit of consumers. Thus, allocative efficiency is desirable insofar as it is achieved within the constraint that the firm is afforded the opportunity to at least earn a normal rate of return.

Promote Realistic and Achievable Gains in Productive Efficiency

- 2.35 Suppliers of services with market power are arguably not subject to the same pressures to reduce their own production costs as firms in a more competitive market. Economic theory suggests that when such firms are subject to certain forms of regulation, they may have incentives to overstate costs or overcapitalise in production. Well designed regulatory regimes should encourage regulated businesses to move towards a more efficient use of inputs, thereby resulting in superior performance.
- 2.36 In order to do so, regulators often estimate the potential scale of improvements that firms are capable of making during the forthcoming regulatory period in advance (i.e., on an *ex ante* basis), and provide them with the incentives to achieve them. The ability of the Commission to set incentives that are realistic and achievable will depend on the nature of the regulatory instrument being applied. For instance, where the regulatory instrument involves a controlled CPI-X price-path set in advance, regulated suppliers can earn higher than expected profits in the short term, if their performance is superior to that implied by their price-path. Suppliers are permitted to retain a proportion of efficiency gains that are made for a certain

period in order to provide them with the incentive to make such gains in the first place.

- 2.37 Under a CPI-X price-path, efficiency gains are shared with consumers during the regulatory control period in two ways. Firstly, they are shared with consumers during the regulatory control period, because regulated revenues are based on forecasts of efficient operational (and capital) expenditure (e.g., under a building blocks approach)³² or on expected productivity gains (e.g., under a DPP). Secondly, efficiency gains can also be shared with consumers by making starting price adjustments, usually at the beginning of each regulatory control period. The price-path is set to allow firms to benefit from superior performance in the short to medium term, but to share the benefits of efficiency gains with consumers over the medium term. Striking the right balance between providing incentives for firms to perform well, and passing some of the benefits of efficiency improvements to consumers is an important consideration when determining starting prices and making decisions on whether any adjustments are necessary. Starting prices and their potential adjustments under the Reset DPP are discussed further in Chapter 5.
- 2.38 To the extent practicable, given the potential trade-offs between the regulatory principles (see paragraph 2.26 above) and the limits of available information, the Commission has sought to promote appropriate gains in productive efficiency by incentivising cost reductions for the requisite level of service quality, consistent with section 52A(1)(b). Over time, the benefits of productive efficiency gains will be shared with consumers through prices lower than they otherwise would be in the absence of regulation, consistent with section 52A(1)(c).

Promote Dynamic Efficiency by Incentivising Investment and Innovation

- 2.39 The concept of dynamic efficiency tends to be the least well-defined type of efficiency, though it is arguably the most important form of efficiency in practice. This view was supported by submissions to the Discussion Paper.³³ Dynamic efficiency relates to ongoing investment and innovation in the supply of services to consumers over the medium to long term. Consequently, dynamic efficiency relates to the objectives in section 52A(1)(a) and (b), and is relevant to promoting the long-term benefit of consumers.
- 2.40 The Commission considers that what matters most for dynamic efficiency is how new investment and innovations will be treated under a regulatory

³² Building blocks, often used in overseas jurisdictions to assist in setting regulated price or revenue caps, focuses on a firm's costs and estimates of what efficient costs might be. It utilises forecasts of firm specific costs and demand over the regulatory period. Forecasts employed under a building blocks approach, however, are generally undertaken or assessed by the regulatory authority in a process which is relatively resource intensive and often contested.

³³ Orion, supra n 21, p. 20; Powerco, supra n 15, p. 14.

regime. If the regulated firm does not expect to make at least a normal return on its efficient incremental investments going forward, it would be unable to maintain the quality of its services and would have no incentive to invest in order to meet expected growth in consumer demand. Such an outcome would not promote the long-term benefit of consumers.

- 2.41 Promoting dynamic efficiency is also consistent with the 2006 Government Policy Statement on the incentives for regulated businesses to invest in infrastructure, discussed in paragraphs 3.6-3.8. The Government considers that these incentives will be achieved—in part—by regulatory stability, transparency and certainty giving businesses the confidence to make long-life investments.³⁴ Certainty under a DPP partly relates to how it is applied and assessed. For instance, the consequences of a breach are potentially more severe under a DPP, than under the Thresholds, given that breaches may directly result in pecuniary or criminal penalties. Previously the Commission would undertake a post-breach inquiry before determining whether further action (i.e., a declaration of control) was required. Despite the Commission having discretion to take enforcement action for breaches, the DPP will be set in a manner that seeks to mitigate the incidence of breaches caused by circumstances that are reasonably beyond the direct control of an EDB, thus providing greater certainty to regulated suppliers. Measures to achieve this, including the mitigation of CPI forecast errors and the normalisation of reliability data, are discussed further in paragraphs 4.45-4.53 and 7.47-7.51 respectively.
- 2.42 As well as expecting to receive at least a normal return on its future efficient investments, a regulated firm should also be able to make a normal return on the efficient investments it has already made. This ensures that the firm will have incentives not just to remain in the market, but to make further efficient investments in replacement, upgraded and new infrastructure as well. An upward starting price adjustment may be appropriate at the beginning of a regulatory period to ensure that a firm can expect to receive at least a normal return into the future. The Commission's draft decisions on starting prices and potential starting price adjustments under the Reset DPP are set out in Chapter 5.
- 2.43 However, promoting dynamic efficiency is about much more than just incentivising efficient investment. It is about the discovery, use and transmission of fresh ideas and new information. In competitive markets, genuine innovations that raise productivity above that previously possible are rewarded by greater than normal returns (at least in the short run given that prices may over time adjust to levels reflecting normal returns). It is very difficult, however, to replicate this sort of reward structure in a regulated

³⁴ Hon Lianne Dalziel, *Government's Policy Statement: Incentives of Regulated Businesses to Invest in Infrastructure*, Minister of Commerce, 7 August 2006, clause 7(a).

market due, in part, to the problems associated with identifying true innovation.

- 2.44 In most markets, competitive forces also put pressure on firms to undertake investments at the socially optimal time. The Commission considers that effective regulation can play a similar role to workable competition in this regard, albeit imperfectly, and not without cost. As with productive efficiency, firms that are subject to a CPI-X price-path set in advance have incentives to make more efficient investments (or to undertake more efficient trade-offs between capital and operating expenditure) than those implied by that price-path. However, a price-path may give firms an incentive to defer investment (to earn greater profits) at the expense of service quality. The Act protects against this by including specific provisions for quality standards to ensure that suppliers do not seek to reduce service quality below that demanded by consumers, consistent with section 52A(1)(b). This matter is considered in the design and structure of the Reset DPP, as discussed in section 3.6, and when setting quality standards under the Reset DPP, as discussed in Chapter 7.
- 2.45 Overall, the Commission considers that promoting dynamic efficiency by promoting incentives for efficient investment and innovation will promote the long-term benefit of consumers, consistent with section 52A(1)(a) and (b).

Role of a DPP in Promoting the Statutory Purpose

- 2.46 The proposed use of a CPI-X price-path under a DPP recognises that regulated suppliers will face inflationary and other increasing cost pressures in respect of their incremental capital and operating expenditures during a regulatory period. However, a CPI-X price-path also places incentives on suppliers to improve their efficiencies in real terms over that regulatory period, consistent with section 52A(1)(a) and (b). This is because they get to keep the benefits of efficiencies greater than those implied by their CPI-X price-path for a number of years (i.e., at least until the price-path is reset at the beginning of the next regulatory period).
- 2.47 These efficiency gains are realised by the supplier in the form of higher profits, but are shared with consumers over the long-term through prices that are lower than would otherwise be the case, consistent with section 52A(1)(c). Some of this sharing can occur during the regulatory period, due to the X-factor in the CPI-X price-path. Furthermore, because regulated suppliers have an incentive to outperform the efficiency expectations implicit in the CPI-X price-path, this increases the level of benefits that are potentially available to be shared with their consumers at the end of the regulatory period, when the price-path is reset. The use of CPI-X under the Reset DPP is discussed further in paragraphs 4.5-4.12. Finally, given that a price-path acts to limit the level of revenue that a regulated supplier can earn, if set appropriately it will also limit excessive profits, consistent with section 52A(1)(d).
- 2.48 In general, when setting a DPP, the Commission proposes to provide the opportunity for regulated suppliers to earn greater than normal returns as a reward for improved efficiency (including in respect of efficient investment) and for innovation. However, the ability of the Commission to provide

expected outcomes more consistent with normal returns will depend on what form of price-quality path is being implemented and the different constraints that apply. For instance, a DPP will not be able to fully reflect the particular circumstances of an individual supplier to the same extent as a CPP—one of the key features of default/customised price-quality regulation is that, where a regulated supplier subject to a DPP expects to receive less than normal returns over the current regulatory period, it may make a proposal for a CPP.

- 2.49 The quality standards in a DPP are intended to ensure that, in response to the cost reducing incentives provided by the CPI-X price-path, regulated suppliers do not lower service quality below the level demanded by consumers, consistent with section 52A(1)(b).

Implementation Principles

- 2.50 In addition to applying appropriate economic principles to achieve the Part 4 Purpose, the Commission has sought to reduce ambiguity and increase predictability of regulatory outcomes over time. The Commission has therefore sought to use the implementation principles, discussed in paragraphs 2.51-2.55, to guide its decision-making on the Reset DPP.

Consistency

- 2.51 The Commission has sought to be consistent, wherever possible, with previous regulatory decisions—while taking account of the Part 4 Purpose—when making its draft decisions on the Reset DPP. This consistent approach also applies to the analysis that underpins these draft decisions. In reaching its draft decisions, the Commission has treated all EDBs consistently. The Commission considers that consistency in its decision-making will lead to more predictable regulatory outcomes and reduce uncertainty for suppliers and investors. A consistent approach to decision-making should also apply through time. This is particularly relevant given the transitional nature of the Reset DPP and the Initial Reset Determination.

Flexibility

- 2.52 An objective of the Part 4 regulatory regime is to provide certainty for suppliers (e.g., the statutory provisions for resetting a DPP are relatively prescriptive), thereby promoting incentives for efficient infrastructure investment. However, as far as is appropriate, regulatory decisions should take into account both prevailing market conditions and those that can reasonably be expected in the future, including technological progress. Consequently, a prescriptive approach that minimises uncertainty under current conditions—in other words, ‘regulatory commitment’—must be balanced against the need for regulation to adapt and remain applicable as industry and market conditions evolve over time. Where the Commission has considered it necessary to depart from previous regulatory approaches, these draft decisions will be explained.
- 2.53 A degree of flexibility is inherent in default/customised price-quality regulation, as businesses can make a proposal for a CPP that better meets their circumstances (e.g., to allow for increased capital investment). The Commission considers that the flexibility that a CPP provides is important, given that a DPP may not suit every supplier’s particular circumstances.

Cost-Effectiveness

- 2.54 A less burdensome method to achieve the regulatory purpose is always preferable to a more onerous one, all other things being equal. Consideration should be given to ensuring that the necessary technical expertise is drawn on to address relevant issues and consider alternative options. In addition, the process should be cost-effective in the sense that matters arising should be dealt with expediently and the compliance burden imposed on businesses should be considered in relation to the expected regulatory benefit. This is because, among other things, the compliance and administration costs associated with implementing regulation can have a bearing on productive efficiency. In addition, section 53K envisages that a DPP be set on a relatively low-cost basis. The Commission has sought to make draft decisions that are both appropriate and cost-effective to implement.

Transparency

- 2.55 The Commission has sought to be clear and transparent when making its draft decisions on the Reset DPP. The Commission has used sound analytical foundations to ensure robust decisions are made and, where possible, the underpinning analysis has been based on established techniques. Where practicable, the Commission has also sought to draw on regulatory decisions in other jurisdictions to inform its decision-making. The Commission has sought to keep interested parties informed of its decision making process and has provided opportunities for them to present their views, including on the draft decisions presented in this paper. These views will be considered by the Commission and will be used to inform its final decisions.

CHAPTER 3: CONSIDERATIONS FOR THE RESET DPP

3.1 This chapter sets out the considerations that, in addition to the Part 4 Purpose and the Section 53K Purpose, have informed the Commission's decision-making relating to the Reset DPP.

3.2 Introduction

3.2 In addition to the Part 4 Purpose and the Section 53K Purpose, the Commission has taken into account a number of further considerations when reaching the draft decisions set out in this paper. These considerations are discussed in this remainder of this chapter, and include:

- *Government Policy Statements*: as provided to the Commission under section 26 of the Act;
- *Energy Efficiency*: obligations relating to energy efficiency provided for under section 54Q of the Act;
- *Decisions under the Electricity Act 1992*: consideration of which are required under section 54V of the Act;
- *Context of the Reset DPP*: relevance of the input methodologies work programme and the current economic climate; and
- *Structure of the Reset DPP*: the need to incorporate relevant price and quality dimensions into the Reset DPP.

3.3 Government Policy Statements

3.3 Section 26 of the Act requires the Commission to have regard, when exercising its powers under the Act, to Government policy statements ("GPS") transmitted to it, in writing, by the Minister of Commerce. To date, two GPSs of relevance to the Reset DPP have been transmitted to the Commission. These concern electricity governance and infrastructure investment incentives, and are discussed below.

Electricity Governance

3.4 The Government initially issued a GPS in relation to electricity governance in October 2004. It has been subsequently updated in 2006, 2008, and May 2009 ("2009 GPS"). The 2009 GPS sets out statutory objectives for the Electricity Commission and the Government's expectations and intentions regarding the interrelationship between the Commission and the Electricity Commission in relation to the regulation of electricity lines businesses. The current objectives of the 2009 GPS are to ensure that electricity is produced and delivered to all classes of consumers in an efficient, fair, reliable and environmentally sustainable manner and to promote and facilitate the efficient use of electricity.

3.5 Relevant to the Commerce Commission are objectives relating to energy efficiency, and the Commission's role in providing incentives for demand side management and reducing energy losses. The Commission notes that these objectives are consistent with the obligations under section 54Q. A Protocol to the Memorandum of Understanding between the Commerce Commission and Electricity Commission states that the Commission will

have regard to these objectives when implementing the Part 4 regulatory regime.

Infrastructure Investment Incentives

- 3.6 In August 2006, the Government issued a GPS relating to the incentives of regulated businesses to invest in infrastructure (“2006 GPS”). The 2006 GPS states that the Government considers this objective will be achieved by:
- (a) *regulatory stability, transparency and certainty giving businesses the confidence to make long-life investments;*
 - (b) *regulated rates of return being commercially realistic and taking full account of the long-term risks to consumers of underinvestment in basic infrastructure; and*
 - (c) *regulated businesses being confident they will not be disadvantaged in their regulated businesses if they invest in other infrastructure and services.*
- 3.7 The 2006 GPS also states that the Government considers it important that regulatory control ensures: (a) the consumers of regulated businesses are not disadvantaged by the investments of regulated businesses in other infrastructure and services; (b) regulated businesses are held accountable for making investments in that business where those investments have been provided for in regulated revenues and prices; and (c) regulated businesses provide infrastructure at the quality required by consumers at an efficient price.
- 3.8 The Commission considers that the objectives of the 2006 GPS are consistent with the Part 4 Purpose, including the emphasis on promoting outcomes consistent with those produced in competitive markets such that suppliers “have incentives to innovate and to invest, including in replacement, upgraded, and new assets”.³⁵

Consideration of Government Policy Statements

- 3.9 The Commission has assessed and had regard to both the 2006 GPS and the 2009 GPS when forming the draft decisions in this paper. For instance, seeking to promote dynamic efficiency by providing incentives for efficient investment (discussed in paragraphs 2.39-2.45) is consistent with the 2006 GPS. These incentives to invest and the promotion of investor confidence are strongly linked to regulatory certainty. As discussed in this paper, certainty will be impacted by the form of the Reset DPP and how the various elements are defined and assessed (e.g., the development of quality standards that mitigate the risk of certain breaches, discussed in Chapter 7).
- 3.10 Submissions on the Discussion Paper did not mention either of the GPSs, nor how the Commission should give consideration to GPSs in its decision-making process.

³⁵ supra n 5, section 52A(1)(a).

3.4 Energy Efficiency

- 3.11 Section 54Q requires that the Commission, when applying Part 4, must promote incentives, and avoid imposing disincentives, for EDBs to:
- a) invest in energy efficiency and demand-side management; and
 - b) reduce energy losses.
- 3.12 Energy efficiency activities contemplated in section 54Q include demand side management and the reduction of energy losses. Demand side management involves an EDB taking measures to facilitate and encourage the efficient use of electricity by end-use consumers. Energy losses from distribution systems are inevitable, but there are measures (e.g., the use of low-loss transformers) that can be taken by an EDB to reduce them.
- 3.13 For clarity, in the remainder of this section the term ‘energy efficiency’ includes demand side management and network energy loss reduction.

Commission’s Preliminary Views on Energy Efficiency

- 3.14 The Discussion Paper set out the Commission’s preliminary views on its interpretation of section 54Q and the possible implementation of energy efficiency mechanisms under the Reset DPP. These views are summarised below.
- 3.15 The Commission stated that the requirements of section 54Q apply to the effect of Part 4 regulation as a whole rather than to each individual instrument. Under Part 4, EDBs are subject to a DPP (or alternatively a CPP), and information disclosure regulation. The DPP is intended to serve as a generic and relatively low-cost instrument. In light of these characteristics, the Commission suggested that the information disclosure and CPP instruments may provide more effective methods to meet the section 54Q requirements.
- 3.16 When considering the implementation of the Reset DPP, section 54Q is but one important factor. The extent to which energy efficiency can be promoted under the Reset DPP needs to be considered in light of the purpose statements relevant to the DPP. As an example, while certain investments may promote energy efficiency and lead to lower energy losses, these investments may not be the most efficient in terms of overall lifecycle cost, which potentially makes them inconsistent with section 52A(1)(b).
- 3.17 The Commission agrees with the submissions to the Process Paper that commented on the complexities relating to the promotion of energy efficiency under the Reset DPP. These submissions also commented on the risks of implementing a mechanism that is not sufficiently robust or does not provide appropriate incentives.³⁶

³⁶ Orion, *Submission on Reset of Default Price-Quality Path for Electricity Distribution Businesses - Process and Issues Paper*, 15 April 2009, p. 8; and Powerco, *Powerco’s Submission to Reset of*

- 3.18 The Commission considers that it is important to take a cautious approach when seeking to implement dedicated mechanisms to promote energy efficiency. Addressing the complexities in testing and implementing a robust energy efficiency mechanism, in a manner consistent with section 52A, may not be feasible under the Reset DPP within the time available.

Submissions

- 3.19 Most submissions to the Discussion Paper responded to the Commission's preliminary views on energy efficiency. Also of note is ENA's 18 May 2009 submission on energy efficiency incentives, which, due to timing, was unable to be addressed in the Discussion Paper.³⁷ Submissions commented on the Commission's interpretation of section 54Q, proposed mechanisms for inclusion in a DPP and discussed the timing for their introduction. These issues are discussed below.

Interpretation of Statutory Requirements

- 3.20 In its submission to the Discussion Paper, ENA stated that the section 54Q requirement applies to all Commission activities under Part 4, and does not allow for selective application to only some of the regulatory instruments that apply under Part 4.³⁸
- 3.21 The Commission considers that the requirements under section 54Q are to be met through the combined application of the regulatory instruments that apply to EDBs under Part 4 (i.e., the DPP or alternatively CPPs should they apply, and information disclosure). In determining whether an energy efficiency mechanism might be appropriate under the Reset DPP, the Commission must consider the proposed mechanism in light of the Part 4 and section 53K purpose statements.
- 3.22 As discussed in paragraph 2.10, a DPP is intended to be a low-cost, generic instrument. This is an important consideration when assessing proposals put forward by submitters (discussed in paragraphs 3.23-3.28) given the complexity of some of the proposed mechanisms and the need for EDBs to demonstrate the effectiveness of the initiatives. In addition, it is likely to be difficult to promote firm-specific initiatives under a DPP, particularly one that can differentiate energy efficient outcomes from underlying trends (e.g., general volume reductions).³⁹

Default Price-Quality Path (DPP) for Electricity Distribution Businesses: Process and Issues Paper, 15 April 2009, p. 4.

³⁷ ENA, *Energy Efficiency Incentive Issues*, 18 May 2009.

³⁸ ENA, *supra* n 18, p. 5.

³⁹ This is a view also shared by Aurora, *supra* n 19, p. 23.

Energy Efficiency Mechanisms

- 3.23 ENA,⁴⁰ Unison Networks Limited⁴¹ (“Unison”) and Wellington Electricity Lines Limited (“Wellington Electricity”)⁴² supported the inclusion of energy efficiency mechanisms under a DPP. These included ENA’s proposal that the following three forms of incentive mechanisms could be developed for incorporation into a DPP:
- financial incentives to manage transmission peak demands;
 - ability to encourage energy efficiency by changing distribution pricing structures, including the ability to account for revenue risk that may arise from any uncertainty in forecasting consumer reactions; and
 - incentives for incremental investment in system fixed assets to reduce line losses.⁴³
- 3.24 No detail was provided on a proposed implementation of these mechanisms, although an example in ENA’s energy efficiency submission contemplated implementing the third mechanism as a form of pass-through cost.
- 3.25 A number of submissions also proposed high level approaches to developing energy efficiency initiatives. Aurora, for example, suggested three classes of EDB incentive schemes, and proposed a list of considerations for the design of a scheme.⁴⁴ ENA and Powerco (in its submission on the Provisions Paper) each proposed a set of objectives for energy efficiency mechanisms.⁴⁵ Various submitters provided examples of possible energy efficiency initiatives that EDBs could undertake.⁴⁶
- 3.26 The proposals noted that some of these initiatives are intended to reduce end-user demand for electricity. Given that distribution prices are largely charged on a volume basis, any reduction in usage results in foregone revenue for an EDB. Many initiatives are also likely to involve expenditure by the EDB, whether it be operating expenditure, capital expenditure or both. Some of the submissions included proposals that would recover the foregone

⁴⁰ ENA, supra n 18, paragraph 15.

⁴¹ Unison, *Reset of Default Price-Quality Path for Electricity Distribution Businesses Discussion Paper*, 17 July 2009, p. 3

⁴² Wellington Electricity, *Submission to the Commerce Commission on its Discussion Paper on a Reset of Default Price-Quality Path for Electricity Distribution Businesses*, 17 July 2009, p. 6.

⁴³ ENA, supra n 18, p. 4.

⁴⁴ Aurora, supra n 19, p. 23.

⁴⁵ ENA, supra n 37, pp.3-4; and Powerco, *Submission on the Regulatory Provisions of the Commerce Act 1986*, 16 February 2009, p. 33.

⁴⁶ Aurora, supra n 19, p. 29; Energy Efficiency and Conservation Authority (“EECA”), *EECA Submission on the Reset of Default Price-Quality Path for Electricity Distribution Businesses Discussion Paper*, 17 July 2009, paragraph 19; ENA, supra n 18, paragraph 16; Unison, supra n 41, p. 3; and Vector, supra n 11, paragraph 43.

revenue (for example, Vector⁴⁷ and Unison⁴⁸) and some included proposals to recover the direct cost of various initiatives (for example, the Energy Efficiency and Conservation Authority⁴⁹ (“EECA”). Some submissions (for example, Vector⁵⁰) included proposals to recover from consumers the direct cost of various initiatives if they have been effective in reducing energy losses. However, ENA’s submission noted that there is “neither a ready to hand methodology nor good quality data to provide the basis for systematically measuring technical losses on electricity distribution networks”.⁵¹

- 3.27 ENA noted that some energy efficiency initiatives (e.g., load management, energy efficiency advisory services, and distributed generation) undertaken by EDBs may use the same assets used to provide the electricity lines service. ENA requested that the Commission clarify how the EDBs should allocate costs that are common to the electricity lines service and to an energy efficiency service.⁵² This issue is likely to be considered under the Commission’s process to determine a cost allocation input methodology.
- 3.28 PricewaterhouseCoopers (“PwC”) stated that “allowing EDBs the freedom to determine their own pricing structures to incentivise customer behaviour” would be an explicit incentive mechanism.⁵³ The Commission notes that providing the “ability to encourage energy efficiency by changing distribution pricing structures” was also part of the second of ENA’s three incentive mechanisms above. Orion commented that the Commission will achieve its section 54Q objective in relation to energy efficiency by incorporating a notional revenue methodology in the DPP.⁵⁴ The Commission considers that using a notional revenue approach (discussed further in paragraph 3.38) will provide EDBs with flexibility to adjust their pricing structures. Such flexibility would allow EDBs to formulate their prices in a manner that promotes energy efficiency (e.g., reducing the reliance on volume). Price restructuring under the Reset DPP is discussed further in Appendix B.
- 3.29 The Commission has considered submissions seeking the inclusion of dedicated energy efficiency mechanisms. However, it considers that it would be non-trivial to implement potential mechanisms, particularly in light of the requirements of the Part 4 Purpose and the Section 53K Purpose. In

⁴⁷ Vector, supra n 11, p. 14.

⁴⁸ Unison, supra n 41, p. 3.

⁴⁹ EECA, supra n 46, p. 3.

⁵⁰ Vector, supra n 11, p. 15.

⁵¹ ENA, supra n 37, p. 7.

⁵² *ibid.*

⁵³ PwC, *Submission to the Commerce Commission on the Reset of Default Price-Quantity Path for Electricity Distribution Businesses Discussion Paper*, 17 July 2009, p. 16.

⁵⁴ Orion, supra n 21, p. 21.

particular, it may be difficult within the constraints of a low-cost mechanism to:

- identify efficient capital and operational expenditure that has been incurred to improve energy efficiency;
- measure changes in loss volumes and electricity usage directly resulting from the mechanism; and
- identify the net benefits of a mechanism and to accurately assess foregone revenue.

Proposed Process to Develop an Energy Efficiency Mechanism

3.30 Submissions were in broad agreement that it may not be possible to include a dedicated mechanism that promotes energy efficiency under the Reset DPP, to take effect on 1 April 2010.⁵⁵ Submissions noted the time constraints, the need for adequate consultation, and the potential complexities involved with developing and implementing such a mechanism. The Major Electricity Users Group (“MEUG”) is a strong proponent of this view, stating that the Commission has a number of higher priorities to consider in developing the DPP than to incorporate dedicated section 54Q mechanisms.⁵⁶ Powerco also submitted that it is important to take a cautious approach when looking to implement energy efficiency initiatives.⁵⁷ These views are consistent with the Commission’s preliminary views in paragraph 3.18.

3.31 In general, however, submissions were of the view that the inclusion of a specific mechanism to promote energy efficiency under a DPP warrants further investigation.⁵⁸ Many of the submissions proposed that the Commission work with ENA, or EDBs generally, to create workable incentives that align with the Part 4 Purpose and which could be implemented during the forthcoming regulatory period. For instance, PwC submitted that it supported the ENA May 2009 submission and suggested that the Commission work with ENA to further consider energy efficiency mechanisms for the Reset DPP.⁵⁹

3.32 The Commission has considered the specific mechanisms proposed by submissions. The Commission agrees with those submissions that consider it difficult to implement a specific mechanism to take effect on 1 April 2010.

⁵⁵ Aurora, supra n 19, p. 23; Eastland, *Submission on the discussion paper ‘Reset of Default Price-Quality Path for Electricity Distribution Businesses’*, 17 July 2009, p.9; MEUG, *Submission on Reset of Default Price-Quality Path for Electricity Distribution Businesses*, 17 July 2009, paragraph 21; and Powerco, supra n 15, paragraph 18.

⁵⁶ MEUG, *ibid*, p. 4.

⁵⁷ Powerco, supra n 15, p. 17.

⁵⁸ Eastland, supra n 55, p.9; ENA, supra n 18, paragraph 16; Powerco, supra n 15, p. 16; PwC, supra n 53, p. 12; and Wellington Electricity, supra n 42, p. 6.

⁵⁹ PwC, supra n 53, p. 12.

As such, the Commission will consider relevant proposals following the publication of the Initial Reset Determination.

- 3.33 PwC proposed that provision for an energy efficiency incentive mechanism be embedded in the Initial Reset Determination, with implementation details developed and implemented later during the regulatory period. This sentiment was echoed in submissions that supported the implementation of a mechanism within the regulatory period.⁶⁰
- 3.34 The Commission considers that it is neither appropriate nor necessary to embed an energy efficiency mechanism within the Initial Reset Determination. The Commission considers it inappropriate to commit to a scheme that would not have been fully tested or whose benefits and costs have not been quantified. In addition, should an appropriate mechanism be developed during the regulatory period, the Commission has the ability to amend a Determination following consultation with interested parties.

The Commission's Current Views on Energy Efficiency

- 3.35 After taking submissions into account the Commission retains the view that, on balance, it is important to take a cautious approach when seeking to implement dedicated energy efficiency mechanisms. Within the time available prior to the Initial Reset Determination being published (i.e., until December 2009), the Commission considers that implementing a robust energy efficiency mechanism—in a manner also consistent with the purpose statements relevant to DPPs—is not feasible.
- 3.36 An important consideration when considering the appropriateness of including a dedicated energy efficiency mechanism under a DPP is the Section 53K Purpose and the intention for a DPP to be a low-cost instrument. As discussed in paragraph 3.29, it may be difficult to assess efficient expenditure associated with energy efficiency initiatives, and to identify outcomes that directly result from the mechanism.
- 3.37 In response to submissions (see paragraph 3.33) seeking that energy efficiency provisions be included in the Initial Reset Determination, the Commission considers that it would be inappropriate to commit to a mechanism, the costs and benefits of which are unknown. A mechanism should not be introduced until the benefits and costs have been quantified, so as to avoid unintended and potentially perverse outcomes. Similarly, its impact would need to be assessed against the outcomes prescribed in the Part 4 Purpose and Section 53K Purpose, as discussed in paragraph 3.21 above.
- 3.38 As is discussed in paragraph 3.28, the Commission proposes to use a notional revenue approach under the Reset DPP. In using such an approach the Commission would provide EDBs with a degree of flexibility in respect of their pricing structures. This flexibility to adjust pricing structures could be

⁶⁰ Eastland, supra n 55, p. 9; Powerco, supra n 15, p. 17; and Wellington Electricity, supra n 42, p. 6.

employed to promote energy efficiency (e.g., by removing a reliance on volumetric pricing). ENA's proposed pricing flexibility mechanism is also likely to be consistent with the use of notional revenue. The Commission considers that by providing EDBs with the flexibility to adjust pricing structures under the price-path, the Commission is promoting incentives and, in particular, avoiding disincentives to the promotion of energy efficiency (as discussed in paragraph 3.28). The Commission considers that this will contribute to it meeting the Part 4 energy efficiency requirements set out in section 54Q. Price restructuring under the Reset DPP is discussed further in Appendix B.

- 3.39 The Commission intends to further consider the potential implementation of a dedicated energy efficiency mechanism under the Reset DPP. Following the publication of the Initial Reset Determination the Commission will seek to work with EDBs and other stakeholders to investigate potential mechanisms. The Commission will give further consideration to those proposals already received and consult on the issues with EDBs and other stakeholders in 2010.

3.5 Context of the Reset DPP

Input Methodologies

- 3.40 When making the Initial Reset Determination, the Commission must specify all relevant input methodologies that apply and EDBs are required to comply with. Input methodology determinations, however, are not to be published until 30 June 2010 (with the possibility of a one-off extension of up to six months), which is after the Reset DPP commencement date of 1 April 2010. The Commission considers that, as no input methodology determinations would have been published by the Reset DPP commencement date, no input methodologies can be specified as applying in the Initial Reset Determination.
- 3.41 Matters covered by input methodology determinations are likely to be of relevance to various aspects of the Reset DPP, including:
- starting price adjustments, in particular the assessment of current and future profitability;
 - the application of claw-back;
 - regulatory processes and rules; and
 - the timing and requirements for CPP proposals.
- 3.42 The Commission intends to amend the Initial Reset Determination following the publication of input methodologies to address such matters.⁶¹ This

⁶¹ The Commission may amend the Initial Reset Determination under section 52Q or 54K. Section 54K provides that if an input methodology had applied at the time the Initial DPP was reset and it would have resulted in a materially different path being set, then the Commission may undertake a further reset of the DPP and may apply claw-back. In such a case, the Commission has nine

amendment may be undertaken in addition to an amendment relating to starting price adjustments, discussed further in paragraphs 5.15-5.33.

Re-openers

- 3.43 A specific matter that was addressed by a number of submissions⁶² to the Discussion Paper was that of re-openers.⁶³ Under the input methodologies process, the Commission is considering the use of re-openers to account for circumstances in which it may be necessary to reconsider the provisions of a DPP. The Commission has previously stated that re-openers should provide for unforeseen and uncontrollable events that are exogenous to the regulated supplier, and such events should be of sufficient materiality to the supplier that the price-quality path set at the outset may no longer be appropriate and may require to be reset.⁶⁴
- 3.44 It was the Commission's preliminary view that circumstances under which a DPP may be re-opened are likely to be limited to events that affect the industry as a whole and which cause significant cost increases across all EDBs. This was primarily because of the opportunity for EDBs to make a CPP proposal, which could address any significant business-specific event. In addition, if the Reset DPP was re-opened, it would be re-opened for all EDBs given that it is initially (prior to starting price adjustments) a generic instrument.
- 3.45 In the absence of input methodology determinations, the Commission's preliminary view was that a provision for re-openers was not specifically required for the interim period between the commencement date for the Reset DPP and the publication of input methodology (likely to be only three months). The input methodology determination provisions relating to re-openers could be adopted, where relevant, following their publication.

Submissions on Re-openers

- 3.46 A number of submissions were received on the possible inclusion of re-openers. All generally supported the inclusion of specific provisions under a DPP. Submissions suggested various circumstances under which re-opener provisions should be specified. Submissions commented that a force majeure event might occur and that the existing DPP may become inappropriate as a result and potentially require resetting. In general,

months to reset the DPP after the publication of the relevant input methodology. The Commission can also make an amendment to any Determination under section 52Q. The Commission must consult with interested parties on any material amendments to be made under this provision.

⁶² Unison, supra n 41, p. 3; Aurora, supra n 19, p. 27; Eastland, supra n 55, pp. 11-12; Powerco, supra n 15, p. 18; ENA, supra n 18, paragraphs 22-23; Orion, supra n 21, p. 23; Wellington Electricity, supra n 42, p. 10; PwC, supra n 53, pp. 15-16; Vector, supra n 11, paragraphs 56-57.

⁶³ For clarity, the Commission does not consider that the term "re-openers" should include or refer to transition related amendments that are proposed for the Initial Reset Determination (e.g., deferred price starting adjustments).

⁶⁴ Commerce Commission, *Input Methodologies Discussion Paper*, 19 June 2009, Chapter 4.

submitters felt that it would be inappropriate to rely on the CPP regulatory mechanism to resolve events that affect a large number of EDBs.⁶⁵

- 3.47 Submissions presented differing views on the inclusion of re-opener provisions for the interim period prior to the publication of input methodology determination. Eastland Network Limited (“Eastland”) and Orion commented that the provisions were not required in the interim, whereas PwC suggested that the provisions should be included in the interim.⁶⁶

Commission’s Current Views on Re-openers

- 3.48 The various circumstances suggested in submissions will be considered by the Commission when reaching its decisions on re-opener provisions as part of the input methodologies work programme. In the interim, the Commission does not consider it necessary to include re-opener provisions for the period from 1 April 2010 until the input methodology determinations are published. In the highly unlikely event that it is necessary to re-open the DPP during this period, the Commission can amend the Determination under section 52Q.

Draft Decision on Re-openers

- 3.49 The Commission’s draft decision is to adopt the provisions for re-openers as set out in the relevant input methodology, following its publication. No interim provisions for re-openers will be included in the Initial Reset Determination.

Economic Climate

- 3.50 Submissions to the Discussion Paper expressed concern regarding the current economic climate and the impact it may have on EDBs. Both Unison⁶⁷ and Wellington Electricity⁶⁸ indicated that they consider the current climate is likely to decrease the rate of new connections and consequently the capital contributions to EDBs. Orion also commented that it had concerns whether any EDB could reasonably be expected to achieve a productivity growth rate throughout the term of the DPP in excess of an average business in the wider economy.⁶⁹

⁶⁵ Aurora, supra n 19, p. 27; Eastland, supra n 55, p. 11; ENA, supra n 18, paragraphs 21-23; Orion, supra n 21, p. 23; Powerco, supra n 15, p.18; PwC, supra n 53, p.15; Unison, supra n 41, p. 8; Vector, supra n 11, paragraphs 56-57; and Wellington Electricity, supra n 42, p. 10.

⁶⁶ Eastland, supra n 55, pp. 11-12; Orion, supra n 21, p. 23; and PwC, supra n 53, pp. 15-16.

⁶⁷ Unison, supra n 41, p. 23.

⁶⁸ Wellington Electricity, supra n 42, p. 8.

⁶⁹ Orion, supra n 21, p. 15.

- 3.51 To account for this, Powerco,⁷⁰ Wellington Electricity,⁷¹ Unison⁷² and Orion⁷³ all suggested that the Commission should take a conservative approach in setting the rate of change, and to current and future profitability assessments when setting starting prices. Orion suggested that the Commission should, as a matter of judgement, take into account the current economic climate when making decisions on starting prices and the rate of change.⁷⁴
- 3.52 The Commission acknowledges the state of the current economic climate and the concerns expressed by EDBs. The Commission will have regard to these issues when making decisions on the Reset DPP, in particular when setting an appropriate rate of change (discussed in paragraphs 6.13)

3.6 Structure of the Reset DPP

- 3.53 A DPP is explicitly required to account for price and quality dimensions of the supply of goods and services, however, the Act does not prescribe how the DPP should incorporate these dimensions in terms of overall structure. The Commission considers that there are two broad options for structuring the Reset DPP. These are that the Reset DPP should specify, either:
- two distinct paths that separately specify and assess price and quality (“dual path”); or
 - a single path that explicitly links price and quality performance (“single path”).

Preliminary Views on the Structure of the Reset DPP

- 3.54 The Commission’s preliminary view was that the Reset DPP should consist of separate price and quality paths (“dual-path”).⁷⁵ The Commission stated that this approach would promote the Part 4 Purpose, particularly section 52A(1)(b) which provides that EDBs have incentives to improve efficiency and provide services at a quality that reflects consumer demands. In addition, separate paths would be consistent with the regulation of price and quality under the Initial DPP, thus supporting the *Consistency Principle*. Given that EDBs are familiar with the mechanics and assessment of separate price and quality paths, the Commission commented that this consistency and transparency would likely provide certainty to EDBs.
- 3.55 The Commission highlighted the time constraints prior to publishing the Initial Reset Determination as preventing the development and

⁷⁰ Powerco, supra n 15, p. 17.

⁷¹ Wellington Electricity, supra n 42, p. 8.

⁷² Unison, supra n 41, paragraphs 5-6.

⁷³ Orion, supra n 21, p. 23.

⁷⁴ Orion, supra n 21, p. 23.

⁷⁵ Commerce Commission, supra n 16, p. 48.

implementation of a robust S-factor mechanism.⁷⁶ It was proposed, however, that a ‘paper trial’ during the Reset DPP could be employed to test a proposed S-factor mechanism prior to possible implementation during the next regulatory period.

Preliminary Views on the Customer Communication Criterion

3.56 Under the Thresholds, the quality threshold included a customer communication criterion that required EDBs to demonstrate that they adequately engaged with their consumers and had taken their views into account. In the Discussion Paper, the Commission’s preliminary view was that an equivalent criterion may be better placed implemented under the information disclosure regime.⁷⁷

Submissions on the Structure of the Reset DPP

3.57 The Commission received numerous submissions on the structure of the Reset DPP. Eastland⁷⁸ and MEUG⁷⁹ outlined their support for the ‘dual path’ proposal. The majority of submissions, however, gave qualified agreement to the approach.⁸⁰ These submissions considered that a more explicit link between price and quality was desirable and that, if implemented effectively, a single path that incorporated an S-factor mechanism would provide greater incentives for EDBs to invest and innovate. Submissions, however, recognised that the 1 December 2009 publication date would not provide sufficient time to develop and implement an S-factor under the Reset DPP. PwC’s submission reflected the view that “the separate price-quality path format is consistent with the format of the existing thresholds and therefore has some implementation advantages, [however]... in time these could be partially combined through the inclusion of an S-factor, or other incentive mechanisms”.⁸¹

3.58 Submissions emphasised the complexities of developing an S-factor mechanism. For example, Powerco stated that “there are numerous difficulties with trying to understand the price/quality trade-off [that underpin an S-factor mechanism] preferred by consumers. The average electricity consumer has limited knowledge of the complexities of the electricity industry and in many cases is not in a position to promote meaningful feedback on this preference.”⁸² In addition, Powerco reflected that there is

⁷⁶ The S-factor mechanism would explicitly apportion a value to changes in quality performance.

⁷⁷ Commerce Commission, supra n 16, p. 110.

⁷⁸ Eastland, supra n 55, p. 11.

⁷⁹ MEUG, supra n 55, p. 1.

⁸⁰ Aurora, supra n 19, p. 27; Powerco, supra n 15, p.18; PwC, supra n 53, p.15; Unison, supra n 41, p. 7; Vector, supra n 11, paragraph 3(c); and Wellington Electricity, supra n 42, p. 9.

⁸¹ PwC, supra n 53, p. 15.

⁸² Powerco, supra n 15, p. 22.

likely to be difficulties in setting a price for quality performance that can be consistently applied across all EDBs.

Commission's Current View on the Structure of the Reset DPP

- 3.59 The Commission considers that it is appropriate for the Reset DPP to have separately assessed price and quality paths. The Commission also considers that further research into an S-factor mechanism is warranted. Although desirable, quantifying the trade-off between price and quality is likely to be complex. Time constraints restrict the Commission from developing and implementing a robust and fully tested mechanism for the Reset DPP.
- 3.60 The Commission has reviewed submissions related to the S-factor and considers that they will help inform further work in this area. The Commission intends to undertake further developmental work with interested parties on a potential S-factor mechanism in 2010. Views expressed in submissions are broadly consistent with this approach, stating that the Commission should develop and implement an S-factor prior to the next reset (likely to be 2015).⁸³ For example, Vector stated that separate price and quality paths are pragmatic under the Reset DPP and submitted that further work to develop a robust S-factor be undertaken as soon as practicable.⁸⁴ Unison proposed that “the price-path include the provision for an S-factor so that such a mechanism could be introduced on a voluntary opt-in basis during the regulatory period.”⁸⁵
- 3.61 The Commission does not consider it appropriate or necessary to include an S-factor ‘placeholder’ in the Initial Reset Determination. Should an appropriate mechanism be developed prior to the next reset, the Commission may amend the relevant Determination following consultation with interested parties.
- 3.62 The Commission considers that implementing the Reset DPP by way of a single price-quality path is not appropriate at this time. There are significant complexities associated with developing an S-factor, particularly in determining the relationship between the marginal costs and benefits of changes in quality. In addition, there is insufficient time prior to the reset to develop an S-factor mechanism that is robust and fully tested. The Commission intends to work with interested parties to further develop a robust S-factor mechanism post 1 April 2010.
- 3.63 The Commission considers it appropriate to implement the Reset DPP using a dual path for the assessment of price and quality. Price and quality are of primary interest to consumers and therefore critical for assessing the long term interests of consumers consistent with the Part 4 Purpose. Separate paths recognise that there is a trade-off between price and quality in

⁸³ ENA, supra n 18, p. 6; Powerco, supra n 15, p.6; and Vector, supra n 11, p.18.

⁸⁴ Vector, supra n 11, paragraph 130.

⁸⁵ Unison, supra n 41, p.7.

supplying electricity lines services. Accounting for both price and quality specifically promotes section 52A(1)(b) of the Part 4 Purpose, which provides that EDBs have incentives to improve efficiency and provide services at a quality that reflects consumer demands. The Commission considers that a dual-path structure is consistent with the Initial DPP and that such consistency is also likely to provide a degree of certainty for EDBs. A breach of either of these paths will be considered a breach of the Reset DPP.

Commission's Current View on the Customer Communication Criterion

- 3.64 The Commission's proposes to develop a customer communication criterion, or an equivalent mechanism, under information disclosure requirements, rather than under a DPP quality-path. The incorporation of consumer engagement activities as part of an asset management plan would also provide a direct (and logical) linkage between consumer requirements and asset management strategies.⁸⁶ The Commission considers that this will provide EDBs with flexibility to develop effective consultation arrangements without the threat of breaching their quality-path. Submissions broadly supported this proposal.⁸⁷

Draft Decisions on the Structure of the Reset DPP

- 3.65 The Commission's draft decision is to structure the Reset DPP to include separately assessed price and quality paths. The implementation of these separate paths is discussed further in chapters four and seven respectively.
- 3.66 The Commission's draft decision is to not include the customer communication criterion as part of the Reset DPP. The Commission proposes that the information disclosure work stream will seek to develop an equivalent mechanism.

⁸⁶ Parsons Brinckerhoff Associates, *Electricity Lines Business Targeted Control Regime: Review of Quality Threshold – Consumer Engagement Criterion for Electricity Distribution Businesses*, Prepared for the Commerce Commission, 10 December 2007.

⁸⁷ Eastland, supra n 55, p. 24; ENA, supra n 18, p. 22; Powerco, supra n 15, p. 24; PwC, supra n 53, p. 36; Unison, supra n 41, p. 32; and Vector, supra n 11, paragraph 136.

SECTION 3: DRAFT DECISIONS

CHAPTER 4: PRICE-PATH

4.1 As discussed in the previous chapter (paragraph 3.65), the Commission's draft decision is to structure the Reset DPP to include separately assessed price and quality paths. This chapter sets out the Commission's draft decisions on the form and application of the price-path under the Reset DPP.

4.1 Introduction

4.2 This chapter deals with the form and content of the price-path. It sets out the main elements of the price-path and is structured as follows:

- *Form of the Price-Path*: the Commission's draft decisions on the overall structure of the price-path;
- *Price-Path under the Initial DPP*: overview of price-path compliance under the Initial DPP and identified implementation issues to be addressed under the Reset DPP;
- *Elements of the Price-Path*: the Commission's draft decisions on the individual elements that form the overall price-path;
- *Pass-through Costs*: the Commission's draft decisions on the specification of pass-through costs; including rates, levies and the appropriate pass-through of transmission charges; and
- *Assessment under the Reset DPP*: an overview of price-path compliance under the Reset DPP.

4.3 When specifying a DPP, the Commission is required to specify and incorporate starting prices and rates of change for regulated suppliers. Draft decisions relating to how these components are to be defined are set out in the following two chapters respectively. Proposed formulae and numeric examples of the application of the price-path are included in Appendix B.

4.2 Form of the Price-Path

4.4 A price-path was previously employed under the Thresholds and currently applies under the Initial DPP. While the Thresholds and the Reset DPP differ in a number of respects, they are likely to share common features and implementation issues, including the manner in which price levels are assessed. The Commission considers that the price-path used under the Initial DPP remains broadly appropriate and has sought to retain its features, where appropriate, under the Reset DPP. The remainder of this section discusses two of these features—a CPI-X mechanism and a weighted average price-cap—proposed for use under the Reset DPP price-path.

Use of CPI-X

- 4.5 The Provisions Paper set out the statutory provisions in the Act relating to rates of change and suggested that a CPI-X mechanism using the Consumer Price Index would be appropriate under the DPP.⁸⁸ The Commission notes that CPI-X instruments are commonly employed by regulators in overseas jurisdictions when regulating utilities under price-control.⁸⁹
- 4.6 As set out in the Process Paper, the Commission suggested that it was appropriate to use a CPI-X mechanism for indexing prices.⁹⁰ Under the Thresholds a CPI-X mechanism was used to index the price-path threshold and derive an “allowable notional revenue” for EDBs.⁹¹
- 4.7 The Discussion Paper set out the Commission’s preliminary view that the price-path under the Reset DPP should be indexed using a CPI-X mechanism.⁹²

Submissions on the Use of CPI-X

- 4.8 Submissions to the Process Paper were in favour of a CPI-X based mechanism. ENA indicated its support for the use of a CPI-X mechanism for indexing the rate of change in prices.⁹³ PwC⁹⁴ and Powerco also supported a CPI-X based approach as the basis of the price-path, with Powerco stating that “it is consistent with the approach taken by regulators internationally”.⁹⁵ Eastland supported the use of the CPI-X mechanism citing that it is well known and is relatively robust from a statistical perspective.⁹⁶
- 4.9 No submissions objected to the Commission’s preliminary view set out in the Discussion Paper. Submissions also suggested methods for the implementation of a CPI-X mechanism.

⁸⁸ Commerce Commission, *Regulatory Provisions of the Commerce Act 1986 – Discussion Paper*, 19 December 2008, p. 111.

⁸⁹ For example, Ofgem use CPI-X (or RPI-X). See RPI-X Review, <http://www.ofgem.gov.uk/Networks/rpix20/Pages/RPIX20.aspx>.

⁹⁰ Where CPI is the Consumer Price Index, as published by Statistics New Zealand, for information see <http://www.stats.govt.nz/datasets/economic-indicators/consumers-price-index-cpi.htm>.

⁹¹ *Commerce Act (Electricity Distribution Thresholds) Notice 2004*, 31 March 2004, clause 5(1).

⁹² Commerce Commission, *supra* n 16, p. 84.

⁹³ For example, ENA, *Submission on the Process & Issues Paper on the DPP Reset*, 15 April 2009, p. 2.

⁹⁴ PwC, *Submission to the Commerce Commission on Default/customised Price-quality Regulation, Reset of Default Price-quality Path for Electricity Distribution Businesses, Process and Issues Paper*, 15 April 2009, paragraph 11.

⁹⁵ Powerco, *supra* n 36, paragraph 6.

⁹⁶ Eastland, *Submission on the Reset of Default price-quality Path for EDBs*, 15 April 2009, p. 4.

The Commission's Current View on the Use of CPI-X

- 4.10 The Commission considers that a CPI-X mechanism meets the regulatory principles as it has the potential to promote efficiency gains and the long-term benefits of consumers and is considered consistent with the Part 4 Purpose (discussed in paragraphs 2.46-2.47).
- 4.11 The proposed use of a CPI-X price-path under the Reset DPP recognises that EDBs will face inflationary and other cost pressures during the forthcoming regulatory period.⁹⁷ A CPI-X price-path will place incentives on EDBs to improve their efficiencies in real terms over the regulatory period, consistent with section 52A(1)(a) and (b). The incentive is that they get to retain the benefits of efficiencies greater than those implied by their price-path, at least until the next reset.

Draft Decision on the Use of CPI-X

- 4.12 The Commission's draft decision is that the price-path under the Reset DPP should be indexed using a CPI-X mechanism.⁹⁸ The incorporation of CPI within the price-path is discussed further in paragraphs 4.45-4.53. The CPI-X mechanism is incorporated in Formula 7 as set out in Appendix B.

Use of Weighted Average Price-Cap

- 4.13 The Act requires that a Determination specify the maximum price or prices that may be charged, or the maximum revenues that may be recovered, by a regulated supplier.⁹⁹ The price-path under the Initial DPP is based on the weighted average price of a business's electricity distribution services, and does not constrain prices for individual services, classes of services, or different customer groups.
- 4.14 In the Discussion Paper, the Commission stated that it may not be appropriate to specify pricing methodologies under a DPP as this would require the specification of prices at a disaggregated level. To do so would require detailed tariff level information from EDBs and a degree of monitoring and analysis that would seem to go beyond the intended scope of a DPP. Such a requirement is likely to be inconsistent with the *Cost-effectiveness Principle*.

⁹⁷ Note that under section 53P(7) the Commission may take into account the effects of inflation on the inputs of suppliers' relevant services.

⁹⁸ The rate of change ("X-factor") is discussed in detail in Chapter 6. The Commission must, in general, set a single X-factor for all EDBs (in accordance with section 53P(5)). The Commission may however set an alternative X-factor for individual EDBs following a price adjustment or as a quality incentive (as provided for under section 53P(8)). As discussed in paragraphs 5.33, the Commission's draft decision is to adjust starting prices following the publication of input methodology determinations. Given that section 53P(8)(a) only relates to adjusted starting prices and in the absence of priced-based quality incentives, the Commission considers that alternative X-factors are not initially relevant for the Initial Reset Determination.

⁹⁹ *supra* n 5, section 53M(1)(a).

- 4.15 The Commission's preliminary view was to specify 'price' under the Reset DPP as a function of prices charged and associated quantities.¹⁰⁰ For the purpose of defining and assessing compliance against the price-path, the Commission proposed to use a form of 'notional revenue'. The proposed approach is consistent with the approach under the Initial DPP,¹⁰¹ the gas authorisation for Powerco and Vector,¹⁰² and that used by other regulators (e.g., Ofgem and the Australian Energy Regulator ("AER")).¹⁰³

Submissions on the Use of a Weighted Average Price-Cap

- 4.16 Submissions to the Discussion Paper generally supported the use of a weighted average price-cap, as it would provide EDBs with flexibility to modify their pricing structures.¹⁰⁴ PwC stated in its submission that it was not appropriate for the Commission to determine maximum prices at a disaggregated tariff level for the purpose of a DPP.¹⁰⁵ The Commission notes that none of the submissions received discussed the potential alternative of using a revenue path.

Commission's Current View on the Use of a Weighted Average Price-Cap

- 4.17 The Commission considers that implementing disaggregated price-paths, each with a common industry X-factor, would limit EDBs' flexibility to reflect changing consumer demands (or other factors) as part of their pricing structures, which might not be conducive to promoting efficiency. Further, a disaggregated approach is likely to involve significantly higher compliance costs. Pricing flexibility within a weighted average price-cap should allow EDBs to respond to changing consumer demand and to price more cost reflectively. As discussed in paragraph 3.38, such flexibility will allow EDBs to adjust their pricing structures in a way that promotes energy efficiency (e.g., by recovering costs using a higher proportion of fixed charges, reducing the impact of energy volumes).
- 4.18 The Commission believes that the proposed approach reflects the stability and certainty sought in clause 7(a) of the 2006 GPS. In addition, the use of weighted average price-cap is likely to be the most consistent with the intent for a DPP to be a cost effective form of regulation as it is relatively easy to apply and to audit.

¹⁰⁰ Commerce Commission, *supra* n 16, p. 51.

¹⁰¹ *supra* n 91, clause 5.

¹⁰² Commerce Commission, *supra* n 17.

¹⁰³ Ofgem, *Electricity Distribution Price Control Revenue Reporting Regulatory Instructions and Guidance - Version 4*, March 2008, p. 10; and AER, New South Wales, *Final Decision, Distribution Determination 2009-10 to 2013-14*, p. 62.

¹⁰⁴ For example, Aurora, *supra* n 19, p. 28; Unison, *supra* n 41, p. 10.

¹⁰⁵ PwC, *supra* n 53, p. 16.

Draft Decision on the Use of Weighted Average Price-Cap

- 4.19 The Commission’s draft decision is that the use of a weighted average price-cap is the most appropriate basis for the price-path under the Reset DPP, as set out in Formula 7 in Appendix B.

4.3 Price-Path under the Initial DPP

- 4.20 This section sets out the assessment formulae currently in use under the Initial DPP and the issues identified with their implementation which potentially can lead to technical breaches (e.g., CPI forecast errors).¹⁰⁶ The Commission considers that addressing these implementation issues will reduce the scope for technical breaches and that doing so will promote certainty for EDBs. These issues are discussed further in paragraphs 4.22-4.24.

Initial DPP Assessment Formulae

- 4.21 Under the Initial DPP the Commission assesses whether an EDB has complied with the DPP by testing whether its notional revenue (defined by Formula 1) has exceeded its allowable notional revenue (see Formula 2).

Formula 1 Notional Revenue under the Initial DPP

$$NR_t = \sum_i P_{i,t} Q_i - K_t$$

where:

$P_{i,t}$	is the <i>i</i> th price at the assessment date occurring in year <i>t</i> ;
Q_i	is the base quantity corresponding to the <i>i</i> th price; ¹⁰⁷
K_t	is the sum of all pass-through costs for the assessment period ending in year <i>t</i> .

Formula 2 Allowable Notional Revenue under the Initial DPP

$$R_t = R_{t-1}(1 + \Delta CPI_t)(1 - (X))$$

where:

R_{t-1}	is the allowable notional revenue under the CPI-X price-path at the assessment date occurring in year t-1.
ΔCPI_t	is the change in the consumer price index over the period between assessments as a percentage.
X	is an annual real reduction in notional revenue over the period.

¹⁰⁶ Some breaches may occur due to a “technicality” arising from how the relevant assessment formulae are specified. These type of breaches are referred to as ‘technical breaches’ and would not warrant investigation by the Commission.

¹⁰⁷ Under the Initial DPP, the quantities Q_i in Formula 1 may also be those applying at the most recent year ending 31 March during which an EDB restructured its prices.

Issues with Initial DPP Assessment Formulae

- 4.22 The Commission's preliminary view was that a comparison of allowable revenue with appropriately defined notional revenue would be appropriate under the Reset DPP.¹⁰⁸ However, a number of issues have been identified with Formula 1.
- 4.23 Formula 1 allowed EDBs to "bear the gains or losses in revenue resulting from changes in chargeable quantities in relation to pass-through costs".¹⁰⁹ The formula relied on a base quantity that was not updated over time and so risked becoming increasingly unrepresentative of current consumption patterns. The Commission proposes to address these issues. A proposed solution set out in paragraphs 4.39-4.42.
- 4.24 Formula 2 required EDBs to forecast a value of CPI for the forthcoming year allowing scope for technical breaches due to forecast errors. These forecast errors might result as estimates used when setting the price-path differ materially from those actual values used when assessing compliance. The Commission proposes to address these issues using a proposed solution set out in paragraph 4.51-4.53.

4.4 Elements of the Price-Path

- 4.25 The Commission's preliminary view was that a comparison of 'allowable revenue' with appropriately defined notional revenue would be appropriate under the Reset DPP. However, the Commission stated that the following elements of the price-path warranted further consideration prior to their implementation under the Reset DPP:
- definition of price;
 - definition of quantity;
 - indexation term; and
 - allowed pass-through costs.
- 4.26 The first three of these are discussed in the remainder of this section, while pass-through costs are considered in the following section.

Definition of Price under Notional Revenue

- 4.27 As set out in the Discussion Paper, the Commission stated that the definition of price, as employed under the Thresholds, could be used to further specify EDB prices under the notional revenue formula. This definition of price, carried forward under the Initial DPP, is considered to be compatible with the

¹⁰⁸ Commerce Commission, supra n 16, p. 98.

¹⁰⁹ Pass-through anomaly as described by Orion, *Submission on the Draft Gazette Notices dated 10 February 2004*, 1 March 2004.

Part 4 concept of price.¹¹⁰ The Commerce Act (Electricity Distribution Thresholds) Notice 2004 (“Thresholds Notice”) provides that price means:

(a) *a posted price in nominal terms (such as a tariff, fee or charge) or a component thereof, that a distribution business charges in relation to a specified service (and which may include discounts, provided those discounts are disclosed in accordance with Part 6 of the Requirements)-*

but does not include-

(b) *any amounts described in paragraph (b) of the definition of pass-through costs.*¹¹¹

4.28 The Commission’s preliminary view was that a definition of price based on that set out in the Thresholds Notice is appropriate for the Reset DPP. The Commission, however, noted that potential adjustments (e.g., unbundling of distribution and transmission charges) to the mechanism used to account for transmission charges may necessitate an adjustment to this definition.

Submissions on the Definition of Price

4.29 Submissions¹¹² to the Process Paper supported the use of the price definition in the Thresholds Notice for the DPP. ENA commented on the advantages of retaining the definition used under the Thresholds Notice, including that it is already known and understood by EDBs and would be relatively straightforward to implement. The majority of submissions to the Discussion Paper did not comment specifically on the proposed definition of price, with the exception of Orion, which stated that in its view the definition of price was acceptable.¹¹³

The Commission’s Current View on the Definition of Price

4.30 The Commission considers that a definition of price based on that set out in the Thresholds Notice is appropriate under the Reset DPP. The Commission considers that this approach reflects the stability and certainty sought in clause 7(a) of the 2006 GPS. The Commission proposes to consider appropriate definitions of price under the input methodology process. Should any adjustment be required to this definition as a result of input methodology determinations, the Commission will amend the Initial Reset Determination following their publication.

¹¹⁰ Section 52C of Part 4 defines prices as follows:

- (a) means any 1 or more of individual prices, aggregate prices, or revenues (whether in the form of specific numbers, or in the form of formulas by which specific numbers are derived); and
- (b) includes any related terms of payment.

¹¹¹ supra n 91, clause 3.

¹¹² Eastland, supra n 96, p. 10; ENA, supra n 93, pp. 5-6; Orion, supra n 36, paragraph 25; Powerco, supra n 36, paragraph 13; PwC, supra n 94, paragraph 18; and Wellington Electricity, *Submission on Reset of Default Price-Quality Path for Electricity Distribution Businesses, Process and Issues Paper*, 15 April 2009, p. 3.

¹¹³ Orion, supra n 21, p. 25.

Draft Decision on the Definition of Price

- 4.31 The Commission's draft decision is that a definition of price based on that set out in the Thresholds Notice is appropriate under the Reset DPP. This is further discussed in paragraph 8.19.

Definition of Quantity under Notional Revenue

- 4.32 As discussed in paragraph 4.22, the Initial DPP formulae use a fixed base quantity in the formulation of both notional revenue and allowable notional revenue. This was generally the quantity applying in the year ending 31 March 2003.¹¹⁴ The Commission noted in the Discussion Paper that the use of a fixed based quantity has certain drawbacks. The composition of quantities inevitably changes over time and quantities may increase or decrease. Over time, the fixed base quantities are likely to become increasingly unrepresentative of the actual quantities, so that the weightings applied to prices are no longer accurate. This can lead to unintended distortions (including the transmission pass-through anomaly discussed in paragraphs 4.72-4.80).
- 4.33 One potential method of mitigating the mismatch of base and actual quantities over time and reducing the possible distortions is by progressively updating base period quantities. This methodology was adopted in the Commission's gas authorisations, where the base or reference quantity was taken to be the relevant audited quantity for the preceding year.¹¹⁵ This type of approach has also been adopted by the Australian regulator and is likely to better reflect current circumstances than a fixed base quantities approach.¹¹⁶
- 4.34 The Commission's preliminary view was that there is merit in using a progressively updating base (or reference) quantity in the notional revenue formula under the Reset DPP.

Submissions on the Definition of Quantity

- 4.35 The majority of submissions expressed their support for the use of annually updated quantities in the notional revenue formula.¹¹⁷ Some commented that the relative simplicity of the fixed quantity approach created tariff structure barriers, as quantities were not reflective of current consumer demand. Submissions also suggested that the fixed quantity approach created potential risks associated with energy efficiency investment, as resulting tariff structure barriers would not allow EDBs to price cost-reflectively, thus

¹¹⁴ A number of EDBs updated the quantity value used in assessments of their respective thresholds in 2006.

¹¹⁵ Refer to Commerce Commission, supra n 17, pp. 188-190, regarding the use of indexing under the gas authorisation.

¹¹⁶ AER, supra n 103, p. 104.

¹¹⁷ Aurora, supra n 19, p. 39; Eastland, supra n 55, p. 21; ENA, supra n 18, paragraph 25; Powerco, supra n 15, p.20; PwC, supra n 53, p.31; Unison, supra n 41, p. 27; and Wellington Electricity, supra n 42, p. 21.

creating potential investment barriers. PwC noted that “in the medium term this [updated quantities] approach is more sustainable as it can be rolled forward into future regulatory periods and allows the relatively easy accommodation of tariff structure changes within a regulatory period”.¹¹⁸

- 4.36 Submissions generally agreed that there was merit in quantities being revised more frequently allowing the notional revenue path to more closely track changes in quantities from year to year. In addition, submissions indicated that progressively updating base quantities may mitigate potential distortions from pass-through cost anomalies (discussed in paragraph 4.77).
- 4.37 A number of submissions highlighted the likely additional compliance costs associated with using annually updated quantities in the notional revenue formula. They suggested that a longer time period would be required to publish the compliance statement. The Commission acknowledges that there are likely to be additional compliance costs for EDBs, however the Commission considers that the additional compliance cost, which is likely to be small, is not unreasonable given the certainty it will provide to EDBs. In addition, as discussed in paragraph 8.42, the additional compliance obligations are to be taken into account by the annual compliance date.
- 4.38 The Discussion Paper requested that EDBs indicate the minimum time period (lag) required to allow for auditing of quantity data for use as base quantities. Aurora noted that the base quantities should be lagged by at least 12 months¹¹⁹ and PwC reiterated Aurora’s view stating that “this would maintain the quantity data consistent with a pricing year. A two-year lag would not be consistent with the objective of maintaining a price-path formula consistent with consumption trends”.¹²⁰

The Commission’s Current View on the Definition of Quantity

- 4.39 In light of submissions, the Commission considers that the annual updating of quantities approach is an improvement to the current methodology as it facilitates a closer correlation between the volumes used in the notional revenue formula and actual volumes during the assessment period. As such the Commission considers that the annual updating of the allowable notional revenue and the notional revenue quantities to be a more appropriate approach.
- 4.40 The Commission’s view is there are two quantity periods appropriate for use as a reference quantity. Firstly, a period two calendar years prior to the assessment date (“t-2 approach”) and secondly, a period one calendar year prior to the assessment date (“t-1 approach”).

¹¹⁸ PwC, supra n 53, p. 31.

¹¹⁹ Aurora, supra n 19, p. 39

¹²⁰ PwC, supra n 53, pp. 31-32

- 4.41 A t-2 approach has the advantage that at the time prices are set base quantities will be known and independently verified by third party auditors. This methodology is likely to provide greater certainty and transparency. A drawback of this approach is that a two year lag decreases the correlation between the assessment and actual quantities. This potential mismatch of quantities increases the possibility of distortions arising from the pass-through anomaly, as discussed in paragraph 4.73.
- 4.42 It is arguable that a t-1 approach is more representative of underlying consumption trends and tariff structures than either a t-2 approach or the Thresholds fixed base quantities approach. The Commission recognises that in implementing the t-1 approach, that it is unlikely that t-1 quantities will be known and that price setting for the purpose of compliance will require a degree of estimation by EDBs. The Commission notes that potential variances between quantity forecasts and audited quantities may lead to distortions in price due to pass-through anomalies. In order to mitigate the potential for technical breaches relating to misestimates, the Commission proposes that the compliance process will only use these estimated quantities. This issue is considered further in paragraphs 4.83-4.84 with a numeric example set out in Appendix B.

Draft Decision on Definition of Quantity

- 4.43 The Commission's draft decision is that it is appropriate to annually update base quantities in the notional revenue formula under a DPP, dispensing with the use of a fixed reference year. Furthermore, the Commission's draft decision is that the t-1 approach is appropriate. This approach is incorporated in Formula 7 as set out in Appendix B.
- 4.44 The use of quantity in the notional revenue formula and the proposed t-1 approach for updating base quantities is discussed in paragraphs 4.83-4.84.

Indexing the Price-Path

- 4.45 As noted earlier, under the Initial DPP, Formula 2 requires EDBs to forecast the value of CPI for the forthcoming year. As such there is scope for technical breaches due to the forecast used to set prices not being equal to the actual value used when assessing compliance. EDBs argued that the potential for CPI related technical breaches leads to a degree of uncertainty.
- 4.46 The Commission's preliminary view was that the manner in which notional revenue is defined, and the way it is used to assess compliance should seek to minimise the potential for CPI forecast errors. One method of minimising CPI forecast errors and the occurrence of associated technical breaches is to use lagged values of the CPI. For example, under the gas authorisations the Commission allows a six month lag between the most recent quarterly CPI change used in the formula and the start of the pricing year.¹²¹

¹²¹ Refer to Commerce Commission, supra n 17, pp. 283-284, regarding the incorporation of CPI under the gas authorisation.

- 4.47 A further option for removing potential discrepancies between forecasted and actual CPI values would be the use of an agreed CPI forecast¹²² for both the setting of prices and assessing compliance with the price-path.

Submissions on Indexing the Price-path

- 4.48 The majority of submissions supported the Commission's proposal to reduce the potential for CPI forecast errors under the Reset DPP. Wellington Electricity expressed its concern about the inherent need to forecast CPI under the Initial DPP.¹²³ Both Orion and PwC indicated that a major concern for EDBs is potential CPI forecasting errors where estimates of inflation must be made.¹²⁴ Orion stated "because compliance is measured against actual CPI movements, a technical breach is possible simply due to forecasting errors".
- 4.49 Powerco's submission noted that it was indifferent between a six month lagged CPI approach and an agreed CPI forecast approach for both setting prices and assessing compliance with the price-path.¹²⁵ Eastland noted that a risk of inaccuracy still remained using a six month lagged CPI, stating that "a particularly low CPI may lower the price-path substantially more than appropriate".¹²⁶
- 4.50 Several EDBs expressed a preference for the use of an agreed CPI forecast for setting prices and assessing compliance with the price-path.¹²⁷ Their submissions suggested applying an 'error adjustment' for the difference between the forecast CPI and actual CPI in the following DPP year. Vector noted that the adjustment would ensure that prices reflect actual CPI movement.¹²⁸

The Commission's Current View on Indexing the Price-Path

- 4.51 The Commission's current view is that the manner in which notional revenue is defined, and the way it is used to assess compliance, should seek to minimise the potential for CPI forecast errors. The Commission recognises

¹²² The use of a recognised CPI forecast would require the inclusion of a forecast from a reputable source or an estimate that reflects the difference between indexed and non-indexed bond rates. The latter would reflect an approach used for WACC calculations in Australia (e.g., AER, supra n 103, p. 63) and is effectively the money market forecast of future inflation. However, given that the New Zealand bond market will not have the same degree of liquidity as that in Australia, an equivalent approach to forecasting CPI for a DPP may not be feasible.

¹²³ Wellington Electricity, supra n 112, p. 2.

¹²⁴ Orion, supra n 36, paragraph 15; and PwC, supra n 94, p. 11.

¹²⁵ Powerco, supra n 15, p.21.

¹²⁶ Eastland, supra n 55, p. 21.

¹²⁷ Aurora, supra n 19, p. 39; Eastland, supra n 55, pp. 21-22; Orion, supra n 21, pp. 3 & 35; PwC, supra n 53, p. 5(vi), pp.32-33; Unison, supra n 41, p. 28; Vector, supra n 11, pp. 128-129; and Wellington Electricity, supra n 42, p. 22.

¹²⁸ Vector, supra n 11, p. 128.

that there are advantages and disadvantages in using either a CPI forecast or lagged CPI. The use of an agreed CPI forecast would mitigate the risk of forecast errors. However, in order to reflect actual CPI, it may be necessary to use an adjustment to account for differences between the forecast and actual values. Any such adjustment would result in additional complexity.

- 4.52 The Commission considers that the use of a lagged CPI will, over time, accurately reflect underlying inflation without the need for an adjustment. In removing the need for an *ex-post* adjustment, the Commission considers that the lagged approach increases certainty and transparency and is consistent with a low-cost approach. Furthermore, the Commission notes that such an approach would be consistent with the approach used under the gas authorisations.¹²⁹

Draft Decision on Indexing the Price-Path

- 4.53 The Commission's draft decision is to implement a lagged CPI indexation of the price-path assessment formulae. The Commission's draft decision is to allow a six month lag between the most recent quarterly CPI change used in the formula and the start of the pricing year. The proposed formula for the calculation of CPI is outlined in **Error! Reference source not found.** below. A numeric example of its implementation is provided in Appendix B.

Formula 3 Proposed CPI Derivation

$$\Delta CPI_t = \frac{CPI_{Dec,t-2} + CPI_{Mar,t-1} + CPI_{Jun,t-1} + CPI_{Sep,t-1}}{CPI_{Dec,t-3} + CPI_{Mar,t-2} + CPI_{Jun,t-2} + CPI_{Sep,t-2}} - 1$$

where:

ΔCPI_t is the deemed change in CPI for the assessment period ending in year t

$CPI_{q,t}$ is the Consumer Price Index ("All groups Index SE9A" figure published by Statistics New Zealand) for the quarter q of the calendar year t

t refers to calendar years ending 31 December

¹²⁹ Commerce Commission, *supra* n 17, pp. 283-284.

4.5 Pass-Through Costs

- 4.54 Under price-quality regulation, regulators generally provide for a pass-through mechanism as a way of appropriately sharing risk—from unforeseen and uncontrollable costs— between suppliers and consumers of regulated services. As set out in the Discussion Paper, the Commission’s preliminary view was that for a type of cost to be eligible for inclusion as a pass-through cost it should be:
- largely outside the control of an EDB;
 - unforeseen (i.e., amount unable to be accurately forecast);
 - defined and approved *ex ante* by the regulator; and
 - relate to a discrete part of the DPP (i.e., a change in this cost will not necessitate the re-opening of other parts of the DPP).
- 4.55 The Commission also stated that it is important for pass-through costs to be applied symmetrically, i.e., both cost increases and cost reductions over a regulatory period should be passed through. The Commission noted that pass-through costs are included in the Initial DPP¹³⁰ and include transmission charges, local authority rates and levies imposed by the Electricity Commission.
- 4.56 The Commission’s preliminary view was that specifying pass-through costs as part of a DPP will assist in providing certainty and transparency. The Commission stated that it may be appropriate to treat the following as pass-through costs:
- local authority rates;
 - Commerce Act levies;
 - Electricity Commission levies; and
 - transmission charges.

Pass-through of Local Authority Rates & Levies

- 4.57 The Commission’s preliminary view was that local authority rates and Electricity Commission levies are beyond the direct control of EDBs, and should be treated as pass-through costs (as per the Initial DPP). The Commission commented that it may also be appropriate to include levies set under the section 53ZE of the Act (“Commerce Act Levies”) related to the cost of the Part 4 regime for EDBs.¹³¹

¹³⁰ supra n 91, clause 3.

¹³¹ supra n 5, section 54X.

Submissions on the Pass-through of Local Authority Rates & Levies

- 4.58 Submissions supported the treatment of local authority rates, Electricity Commission levies and Commerce Act levies as pass-through costs. PwC stated that it supported the “inclusion of transmission charges, local authority rates, Commission levies and EC levies as pass through costs. To date Commission levies have not been included as pass through costs in the thresholds, but they meet all of the criteria and are essentially similar to EC levies, and therefore should be included”.¹³²
- 4.59 A number of submissions noted that the 2009/10 Commerce Act levies should be recovered during the new regulatory period as pass-through costs. ENA noted that “significant Commerce Act levies will be incurred by EDBs in the 2009/10 assessment period, prior to the DPP reset and for which no recovery mechanism is available - the levies being announced after the 2009/10 prices were set.” ENA also commented that “2009/10 Commerce Act levies could be amortised over the next regulatory period to avoid price shocks.”¹³³ This was supported by the majority of submissions.¹³⁴

The Commission’s Current View on Pass-through of Local Authority Rates & Levies

- 4.60 The Commission’s current view is that local authority rates and Electricity Commission levies are beyond the direct control of EDBs, and should be treated as pass-through costs (as is the case under the Initial DPP). The Commission proposes to consider pass-through costs under the input methodologies process. If the relevant specified pass-through costs or their treatment differs from that under the Reset DPP, the Commission will revisit the issue and amend the Initial Reset Determination.

Draft Decision on Pass-through of Local Authority Rates & Levies

- 4.61 The Commission’s draft decision is that the following rates and levies should be treated as pass-through costs under the Reset DPP:
- local authority rates;
 - Commerce Act levies; and
 - Electricity Commission levies.
- 4.62 The Commission considers that Commerce Act levies incurred by EDBs during the Initial DPP should, in principle, be eligible for pass-through under the Reset DPP (e.g., amortised under the regulatory period). A proposal to account for these during the regulatory period is discussed in Appendix B.

¹³² PwC, supra n 53, p. 17.

¹³³ ENA, supra n 18, p. 7.

¹³⁴ For example, PwC, supra n 53, p. 33; Unison, supra n 41, p. 10; and Wellington Electricity, supra n 42, p. 11.

Pass-through of Transmission Charges

- 4.63 Transmission charges are the net amount an EDB is liable to pay to Transpower New Zealand Limited (“Transpower”) or other parties for transmission services. Charges and rebates associated with the transmission network are largely beyond the control of EDBs and are therefore considered for inclusion as pass-through costs.
- 4.64 The Commission’s preliminary view was that transmission charges should be treated as a pass-through cost under the Reset DPP and that accounting explicitly for transmission charges in a robust and predictable manner would increase certainty and transparency under the Reset DPP. As such, the Commission proposed to include transmission charges as a pass-through when assessing compliance with the price-path.

Submissions on Pass-through of Transmission Charges

- 4.65 The majority of submissions supported the continuing pass-through of transmission charges as they are largely beyond EDBs’ direct control.¹³⁵ In its submission to the Discussion Paper, ENA submitted that transmission charges should be passed on in full under the Reset DPP. It considered that financial incentives to manage load can be provided for elsewhere in the DPP.¹³⁶ Eastland noted that the charges and rebates associated with transmission are largely beyond the control of EDBs and therefore, should be considered for inclusion as a pass-through cost in price-control assessments.¹³⁷
- 4.66 Unison commented that “avoided transmission charges arising from DSM [demand-side management], energy efficiency investment, contracted embedded generation etc. should continue to be included as a pass-through, as this will ensure that there are incentives to incur the costs necessary to achieve these gains”.¹³⁸ Unison submitted that EDBs can exercise some control over transmission charges. Avoided transmission charges provide an incentive for EDBs to pursue investments and contracts at a lower cost than transmission charges. Unison also suggested that an incentive mechanism to manage the transmission costs and charges from Transpower is necessary.¹³⁹
- 4.67 MEUG suggested that transmission connection charges should not be treated as a pass-through cost. The reason being that “connection charges are entirely manageable and predictable by the EDB”.¹⁴⁰

¹³⁵ Aurora, supra n 19, p. 28; Orion, supra n 21, p. 24; PwC, supra n 53, p. 17-18; Unison, supra n 41, p. 10; and Wellington Electricity, supra n 42, p. 10.

¹³⁶ ENA, supra n 18, pp. 7-8.

¹³⁷ Eastland, supra n 55, p. 4.

¹³⁸ Unison, supra n 41, pp. 28-29.

¹³⁹ Unison, supra n 41, pp. 28-29.

¹⁴⁰ MEUG, supra n 55, p. 4.

The Commission's Current View on Pass-through of Transmission Charges

- 4.68 While the Commission agrees that transmission charges are predictable, it does not agree that they are directly manageable by EDBs. The Commission retains the view that transmission charges should be treated as a pass-through cost under the Reset DPP as they are beyond EDBs' direct control under the current transmission pricing methodology.¹⁴¹
- 4.69 The boundary between transmission and distribution systems, which are to some extent substitutes, can change over time, and it is possible that some movements in transmission costs will be offset by opposite movements in distribution costs. In addition to boundary changes, transmission charges may be partially avoided through the development of distributed generation. The Commission considers that avoided transmission charges, including as a result of the transfer of assets from Transpower to an EDB or the development of distributed generation, should continue to be treated as pass-through costs.
- 4.70 The Commission proposes to further specify pass-through costs in the input methodology determinations. If the specification or treatment of transmission charges as pass-through costs differs from how they are specified or treated under the Initial Reset Determination, the Commission will revisit the issue following the publication of input methodology determinations.

Draft Decision on Pass-through of Transmission Charges

- 4.71 The Commission's draft decision is that transmission charges should be treated as a pass-through cost under the Reset DPP.

Overview of Pass-through Anomaly

- 4.72 As set out in Formula 1, notional revenue is defined as the sum of the product of the set of tariffs and their respective base quantities, net of pass-through costs. Generally, allowable notional revenue is a function of the previous year's allowable notional revenue and the adjustment allowed by the CPI-X mechanism. The price-path under the Thresholds used a fixed base quantity during the regulatory period. The Initial DPP uses the same fixed base quantity approach.
- 4.73 This definition of the price-path formula resulted in an anomaly in the price-path due to the treatment of pass-through costs for transmission charges. Currently, the recovery of transmission charges is based on a differing set of quantities than the base quantities used as part of the compliance assessment. This means that if an EDB's volumes are changing relative to the fixed

¹⁴¹ The Commission also notes that the transmission pricing methodology is likely to be reviewed during the Reset DPP period. See the Electricity Commission's website for further details <http://www.electricitycommission.govt.nz/opdev/transmis/tpi>.

pass-through of transmission charges, the price-path would allow unintended price changes (i.e., the pass-through anomaly occurs).

4.74 The Commission has previously consulted on this anomaly and published a consultation papers following the 2004 Thresholds reset proposing a number of solutions.¹⁴² The main approaches considered by the Commission for addressing the anomaly were as follows:

- *Indexed Approach*: inclusion of a quantity index term, with a possible ‘unders’ and ‘overs’ mechanism to account for unforeseen variance. While this would correct the anomaly, it required EDBs to forecast (at the start of the year) quantities for the year, increasing the risk of technical breaches due to forecast error;
- *Lagged Approach*: adoption of an *ex-post* approach using the previous year’s prices and quantities as the basis for the current year’s price-path. This effectively lags the price-path by a year. This would effectively address the anomaly and would have the added advantage of reducing the risk of technical breaches. However, such an approach would potentially result in slight errors due to mismatches between the lagged quantity and actual quantities; and
- *Unbundling Approach*: Unbundling and separately assessing prices for distribution and transmission services. An unders and overs account was also proposed to handle variations between forecasts and actuals. The main concern with this option was the complexity of separating the components and of running an unders and overs account.

4.75 In its Discussion Paper the Commission’s view was that EDBs were well placed to assess the relative merits of possible solutions to the anomaly. The Commission also stated it was conscious that previous consultations on this matter were held some time ago and that the nature of the issues may have changed. The Commission therefore sought submissions from EDBs as to the best way of addressing the anomaly.

Submissions

4.76 In its submission to the Discussion Paper, Orion reiterated its view that unbundling could solve the transmission volume anomaly. Orion suggested that transmission charges be unbundled and that compliance tests be applied only to the distribution component. Orion suggested that the base quantities could then be used for the entire regulatory period and that transmission pass-through costs could be adjusted in the following year to account for over or under recovery.¹⁴³

¹⁴² Lawrence, Denis, *Formula for Implementation of Price Thresholds*, Report by Meyrick and Associates to the Commerce Commission, 7 November 2004; and Commerce Commission, *Proposed Changes to the Distribution Thresholds Gazette Notice*, 28 October 2005.

¹⁴³ Orion, *supra* n 21, pp. 34-35.

- 4.77 However, the majority of submissions had differing views to that of Orion.¹⁴⁴ In particular, Aurora believed that it was not necessary to unbundle distribution and transmission charges, given that the proposed reset of base quantities each year should significantly reduce the anomaly, if not totally remove it. PwC also supported the proposed quantity adjustment in the notional revenue and allowable notional revenue. PwC noted that since quantities in revenue and pass-through costs will be continually updating, the relativities between them will be retained and that the quantity adjustment proposal is relatively simple and it avoids unnecessary complexity.
- 4.78 Wellington Electricity noted that the complexity and extra work associated with unbundling the transmission costs may not warrant the benefits. ENA observed that “the Transmission Pricing Methodology is complex and it is currently under review. In addition, the inclusion of transmission as a pass-through combined with the annually updated quantities in the notional revenue and allowable notional revenue provides a low cost and simple solution to the transmission volume anomaly.

The Commission’s Current Views on the Pass-through Anomaly

- 4.79 The Commission notes that the majority of submissions, discussed above, consider the unbundling solution to be too complex. Submitters suggested that the use of annually updating base quantities provides a simple low cost solution that sufficiently addresses the anomaly.
- 4.80 The Commission recognises that the use of annual updating base quantities will not remove the anomaly completely. However, due to the increased consistency and correlation between actual quantities and those used to determine notional revenue, the anomaly will be significantly mitigated. The incorporation of lagged quantities under the notional revenue formula is discussed in Appendix B.

4.6 Assessment of the Reset DPP Price-Path

- 4.81 The Commission notes that in accordance with section 53M(1)(a), every price-quality path must specify a maximum price (or revenue) for suppliers. The proposed Reset DPP price-path does so by assessing whether an EDB's notional revenue has exceeded its allowable notional revenue. The Commission proposes that starting prices¹⁴⁵ will be used to define the starting point of this price-path. Therefore, an EDB's price-path is based on its starting price and the applicable rate of change. For the avoidance of doubt the Commission considers that the actual (weighted average) price for the Reset DPP may be set above the starting point of the price-path. The price-path will be subject to the overall CPI-X constraint, which will be

¹⁴⁴ Aurora, supra n 19, p. 39; ENA, supra n 18, p. 8; Powerco, supra n 15, p. 21; PwC, supra n 53, p. 34; and Wellington Electricity, supra n 42, p. 23.

¹⁴⁵ Including those applying at the end of the preceding regulatory period, i.e., 31 March 2010.

assessed at the end of the assessment period. When defining the price-path in the Initial Reset Determination, the Commission will reflect this intention. This is discussed further in Appendix B.

- 4.82 The Commission's draft decision is that a comparison of allowable notional revenue with appropriately defined notional revenue be adopted under the Reset DPP. The proposed assessment formula for the Reset DPP Price-path is set out in Formula 7 in Appendix B.
- 4.83 Due to the potential occurrence of the pass-through anomaly due to mismatched quantities (as highlighted in paragraph 4.73), the Commission's draft decision is that in conjunction with implementing a t-1 approach, an additional compliance step is appropriate. On assessment:
- (a) an EDB will be required, as part of its compliance statement, to state both the forecasted t-1 base quantity used when setting price and the actual quantity during the t-1 period; and
 - (b) where a variance in the estimation of t-1 has occurred, an EDB shall provide an explanation of the variance.
- 4.84 If EDBs should repeatedly misestimate the t-1 base quantity by a margin of error that exceeds 5%,¹⁴⁶ the Commission may wish to reconsider the use of the t-1 approach (e.g., the compliance process could revert to the use of actual t-2 quantities).

¹⁴⁶ The Commission notes that the 5% error term applies over the full assessment period. This therefore equates to a larger error during the short (3-4 months) period for which the quantity is to be estimated. As such, the Commission considers that the proposed degree of accuracy is not an onerous one.

CHAPTER 5: STARTING PRICES

5.1 This chapter sets out the Commission's draft decisions on the specification of starting prices for EDBs under the Reset DPP.

5.1 Introduction

5.2 As outlined in Chapter 1, the Commission has focussed this Draft Decisions Paper on draft decisions and views directly relating to the Initial Reset Determination. The following issues relating to starting prices, considered to be directly relevant to the Initial Reset Determination, are discussed in this chapter:

- *Use of Starting Price Adjustments*: the Commission's current views on the use of starting price adjustments under a DPP;
- *Starting Price Adjustments during the Reset DPP*: the Commission's proposed timing for starting price adjustments during the Reset DPP; and
- *Specification of Starting Prices*: the Commission's draft decision on the starting prices to apply at the commencement of the Reset DPP.

5.3 Further consideration of assessments and potential implementation of starting price adjustments will be provided following the publication of Initial Reset Determination. An indicative timetable for a consultation process is provided in paragraph 5.33.

5.2 Use of Starting Price Adjustments

5.4 Under a DPP the Commission must set out the starting prices that apply to EDBs. Consistent with this, the Commission will specify starting prices to apply to EDBs (initially) for the Reset DPP in the Initial Reset Determination.

5.5 The Commission is required to specify these starting prices as either "the prices that applied at the end of the preceding regulatory period" or as "prices, determined by the Commission, that are based on the current and projected profitability of each supplier".¹⁴⁷ Thus, in determining starting prices for the Reset DPP, the Commission must decide whether adjustments are appropriate and the timing of any such adjustments.

Preliminary Views on Starting Price Adjustments

5.6 The Commission's preliminary view, as set out in its Discussion Paper, was that adjustments to EDB starting prices under a DPP would—in general—be necessary given the proposed generic nature of the X-factor.¹⁴⁸ Adjustments would allow an appropriate starting price to be specified for each EDB. The

¹⁴⁷ supra n 5, section 53P(3).

¹⁴⁸ Commerce Commission, supra n 16, p. 59.

Discussion Paper stated that starting price adjustments should be applied to EDBs under the Reset DPP.

- 5.7 The Discussion Paper noted that certain business specific circumstances, such as inadequate cash flows or large investment requirements, might be more effectively and appropriately accounted for under a CPP than through starting price adjustments.¹⁴⁹ Price reviews under a CPP are likely to be able to account for more business specific circumstances, in greater detail, than a starting price adjustment under a DPP.

Submissions on Starting Price Adjustments

- 5.8 EDBs generally agreed that starting price adjustments should be made. Aurora believed upward adjustments may be appropriate where businesses have provided superior quality outcomes to consumers.¹⁵⁰ Eastland and Unison noted that adjustments may be necessary to ensure sufficient cash flow for investment where historic prices have been set too low.¹⁵¹ Eastland reiterated its view in its submission to the Discussion Paper “that prices should be adjusted upward where necessary to ensure sufficient cash flow for investment”.¹⁵²
- 5.9 The Discussion Paper also sought views from submitters on the circumstances in which adjustments to starting prices might be appropriate. PwC submitted that as “the X factor is to be generic to all EDBs, it follows that the starting price adjustments for the purpose of the DPP may need to be business specific”. PwC also considered that adjusting starting prices under the Reset DPP was appropriate as adjustments were not made under the Thresholds potentially leading to prices being inappropriate and “that profit adjustments will partly reflect a transition from one method to the next”.¹⁵³ The Commission notes that although the Thresholds included profitability adjustments, these were based on the relative performance of EDBs rather than absolute performance as might apply under a DPP.¹⁵⁴
- 5.10 The majority of submissions (discussed below in paragraphs 5.22-5.23) supported the use of deferred adjustments—if necessary.

¹⁴⁹ *ibid.*

¹⁵⁰ Aurora, *Regulatory Provisions of the Commerce Act 1986, Response to Discussion Paper*, 16 February 2009, p. 30.

¹⁵¹ Eastland, *Submission on Regulatory Provisions of the Commerce Act 1986*, 16 February 2009, p. 15; and CRA International (on behalf of Unison), *Provisions of the Commerce Act*, February 2009, p. 44.

¹⁵² Eastland, *supra* n 55, p. 13.

¹⁵³ PwC, *supra* n 53, p. 19.

¹⁵⁴ Commerce Commission, *Threshold Reset Discussion Paper*, 19 December 2007, paragraph 211.

The Commission's Current View on Starting Price Adjustments

- 5.11 The Commission's view is that it is appropriate—in general—to investigate whether starting price adjustments are necessary for EDBs under a DPP given the generic nature of the proposed common X-factor. The lack of starting price adjustments that were specific to businesses under the Thresholds and Initial DPP further reinforces their likely relevance under the Reset DPP.¹⁵⁵
- 5.12 The Commission considers that the periodic use of starting price adjustments is likely to be required for the majority of EDBs. As such, it proposes to assess whether starting price adjustments are required when resetting a DPP and potentially following the end of a CPP. These assessments would be undertaken using a process determined following consultation with stakeholders.
- 5.13 The Act makes specific provision for starting price adjustments and the Commission considers that assessing whether starting price adjustments are warranted under a DPP and applying them, when appropriate, will promote the Part 4 Purpose.¹⁵⁶ Downward adjustments may be required in cases where EDBs are considered to be earning, or likely to earn, excessive profits and/or to promote the sharing of efficiency gains with consumers. Upward adjustments may be justified where past prices have been too low to allow a business to earn a normal rate of return. Dynamic efficiency is likely to be promoted through the potential for upward price adjustments which facilitate efficient investment and innovation.

Draft Decision on the Use of Starting Price Adjustments

- 5.14 In light of these views, and having considered submissions, the Commission's draft decision is that starting price adjustments should be considered for EDBs under the Reset DPP. The following section considers the appropriate timing of potential adjustments during the Reset DPP.

5.3 Timing of Starting Price Adjustments during the Reset DPP

- 5.15 As set out above, the Commission's draft decision is that starting price adjustments should be considered, in general, when resetting a DPP. In most circumstances, starting price adjustments would take place at the beginning of the regulatory period.¹⁵⁷ However, the reset of the Initial DPP is likely to require a transitional process, as discussed in paragraph 1.6. This results from the respective timing of the Initial Reset Determination and input methodology determinations and the relevance of input methodologies to starting price adjustments (discussed in paragraph 5.28).

¹⁵⁵ As discussed in paragraph 5.9, profitability adjustments under the Thresholds were based on the relative rather than the absolute, performance of EDBs.

¹⁵⁶ *supra* n 5, section 53P (3)(b).

¹⁵⁷ Other than potential adjustments when an EDB's CPP ends.

- 5.16 As noted in paragraph 1.11, the Commission must publish a summary of the Initial Reset Determination by 1 December 2009. However, the input methodology determinations applicable to EDBs are not likely to be made until 30 June 2010.¹⁵⁸ Section 54K(3) of the Act provides that had an input methodology applied at the time the DPP was reset, and the application of that methodology would have resulted in a materially different DPP being set, then the Commission may reset the DPP.¹⁵⁹
- 5.17 Subject to the possible extension, the Commission currently proposes to publish draft and final input methodology determinations in February 2010 and June 2010 respectively. Given that the Act¹⁶⁰ requires a summary of a Determination to be published four months before it comes into effect, any price adjustments would need to be calculated, consulted on and published in an amended Determination by 1 December of the year prior to the EDB pricing year in which it would take effect. The Commission's draft decisions on the timing of starting price adjustments in relation to input methodologies are set out below.

Preliminary Views on the Timing of Starting Price Adjustments

- 5.18 In the Process Paper the Commission presented two possible approaches for specifying starting prices when resetting the Initial DPP. The first approach involved adjusting starting prices for EDBs by 1 December 2009 prior to the publication of relevant input methodology determinations. However, the Commission stated that this approach may require two price adjustments to ensure consistency between input methodologies and the DPP.¹⁶¹
- 5.19 The second approach was to specify starting prices as those that applied at the end of the Initial DPP. Under this approach, starting price adjustments would be deferred until after the publication of the input methodology determinations. Any adjustment could then be made in light of the input methodology determinations and therefore would only involve, at most, a single starting price adjustment. The Process Paper indicated the Commission's preference for this deferred approach.
- 5.20 In the Discussion Paper, the Commission reiterated its preference for the second approach, stating that starting prices should initially be those applying at the end of the preceding regulatory period, in this case the prices as at 31 March 2010.¹⁶² The Commission proposed to assess EDB profitability in light of the relevant input methodology determinations following their

¹⁵⁸ Section 52U(2) of the Act allows for a possible extension of up to 6 months to this deadline.

¹⁵⁹ The Commission notes that input methodologies will be in place at the time of the next full DPP reset, likely to apply from April 2015.

¹⁶⁰ *supra* n 5, section 53M(7).

¹⁶¹ Commerce Commission, *Reset of Default Price-quality Path for Electricity Distribution Businesses – Process and Issues Paper*, 30 March 2009, p. 62.

¹⁶² *ibid*, p. 61.

publication. It proposed that these profit levels would inform starting price adjustments and the application of claw-back, where appropriate.

- 5.21 The Commission further proposed that the deferred adjustment be implemented to take effect from 1 April 2011 to align with the 2011/12 pricing year. This would potentially reduce the need for, and magnitude of, any claw-back adjustments.¹⁶³ Reflecting this, the Discussion Paper provided an indicative timetable for a consultation on deferred adjustments.¹⁶⁴

Submissions on the Timing of Starting Price Adjustments

- 5.22 Submissions to the Process Paper were in favour of the deferred approach, i.e., specifying starting prices as those at the end of the Initial DPP and making any necessary starting price adjustments following the publication of input methodologies. Aurora agreed with this as it would involve only a single adjustment, allow consistency with input methodologies, and also allow adequate time to develop a methodology that takes future and current profitability into account.¹⁶⁵ Vector stated it “strongly supports delaying the making of a P₀ adjustment”.¹⁶⁶
- 5.23 Eastland’s submission to the Discussion Paper also supported the Commission’s proposal for deferred starting price adjustments and went further to offer support for the Commission’s proposed timing of the adjustment stating “the Commission should use P₀ adjustments to starting prices, applying for the period beginning 1 April 2011.”¹⁶⁷
- 5.24 The Discussion Paper also sought views on the appropriate timing of the proposed starting prices adjustments. In general, submitters supported the Commission’s proposal to defer starting price adjustments.¹⁶⁸ ENA in particular commented that it supported a deferred adjustment as “this approach results in only one possible adjustment, [as it] is sequenced to follow the publication of input methodologies”.¹⁶⁹ ENA further indicated its preferences for a deferred adjustment by stating it did not consider it possible

¹⁶³ The degree to which it would influence the need for claw-back would ultimately depend on the criteria for the use of claw-back.

¹⁶⁴ Commerce Commission, supra n 16, p. 62.

¹⁶⁵ Aurora, *Submission on the Process & Issues Paper on the DPP Reset*, 15 April 2009, p. 3.

¹⁶⁶ Vector, *Submission on Reset of Default Price-quality Path for Electricity Distribution Businesses, Process and Issues Paper*, 15 April 2009, paragraph 21.

¹⁶⁷ Eastland, supra n 55, p. 4.

¹⁶⁸ Aurora, supra n 19, p. 10; Eastland, supra n 55, p. 13; ENA, supra n 18, p. 45; Orion, supra n 21, paragraph. 6.3; PwC, supra n 53, 17 July 2009, p. 12; Unison, supra n 41, p. 12; and Vector, supra n 11, paragraph 3a.

¹⁶⁹ ENA, supra n 18, paragraph 43.

to test any proposed starting price adjustments with any confidence prior to the determination of input methodologies.¹⁷⁰

- 5.25 MEUG was the only submitter to support a starting price adjustment prior to the input methodologies determination.¹⁷¹ The Commission does not agree with this view as it considers any benefits of a starting price adjustment prior to the input methodologies determination are unlikely to outweigh the likely uncertainty caused by a second price adjustment.
- 5.26 On the timing of starting price adjustments, the Discussion paper proposed that a post input methodology starting price adjustment should align with the 2011/12 pricing year. Orion, PwC, Vector, ENA and Eastland all supported the Commission's proposal of a 1 April 2011 starting price adjustment.¹⁷² PwC in particular stated "any P_0 reset should apply from the beginning of a pricing year, and accordingly the appropriate determination would need to be gazetted by 1 December of the preceding year. If the input methodology determinations are published by 30 June 2010, a five-month period exists for starting price adjustments to be determined and consulted upon if these are to be implemented for the pricing year commencing 1 April 2011. This timing would minimise the need for claw back given only 12 months would have elapsed since the DPP came into force."¹⁷³
- 5.27 A number of submitters did suggest however that, whilst desirable, a starting price adjustment in time for the 2011/2012 pricing year may be difficult to achieve.¹⁷⁴ The Commission acknowledges the potentially tight timeframe between the 30 June 2010 input methodology determinations and the 1 December 2010 publication date allowing starting prices to take effect for the start at the 2011/2012 pricing year.

The Commission's Current View

- 5.28 Starting price adjustment methodologies used by utility regulators¹⁷⁵ are usually based on metrics relating to the firm's performance (e.g., capital expenditure) and the wider economy (e.g., tax rates), and likely inputs to the adjustment include the weighted average cost of capital ("WACC"), regulatory asset base ("RAB"), operational expenditure, depreciation, and revenue. A number of these inputs will be calculated based on input methodology determinations (e.g., cost allocation, asset valuation, cost of capital and tax). The application of these input methodologies is likely to affect the Commission's assessments of current and projected profitability.

¹⁷⁰ *ibid*, paragraph 45.

¹⁷¹ MEUG, *supra* n 55, paragraph 13.

¹⁷² Eastland, *supra* n 55, p. 4; ENA, *supra* n 18, paragraph 45; Orion, *supra* n 21, paragraph 6.3; PwC, *supra* n 53, p. 20; and Vector, *supra* n 11, paragraph 74.

¹⁷³ PwC, *supra* n 53, p. 20.

¹⁷⁴ Orion, *supra* n 21, p. 26; PwC, *supra* n 53, p. 20; Wellington Electricity, *supra* n 42, p.12.

¹⁷⁵ Ofgem, *Electricity Distribution Price Control, Final Proposals*, November 2004, p.102 and p.109.

These profitability assessments are to be used when making starting price adjustments.¹⁷⁶

- 5.29 As discussed above, submissions considered it important to avoid the need for a second starting price adjustment that may be required to reflect the input methodology determinations. The Commission considers that adjusting starting prices following the publication of input methodology determinations will avoid the need for a second adjustment. A deferred adjustment will also allow greater consistency between the DPP framework and relevant input methodologies. Such an approach will contribute to certainty for EDBs.
- 5.30 Given the proposal to defer the starting price adjustment until after the input methodologies determination, the Commission's view is that the deferred adjustment should align with both the EDB pricing year and the regulatory assessment period, beginning 1 April. The Commission considers this to be the most appropriate timing as it will simplify the EDB's price setting by avoiding the need for a mid-period price adjustment. The approach is also likely to simplify the price-path compliance assessment process during the Reset DPP.
- 5.31 The first possible determination date that aligns with the regulatory and pricing year following the publication of input methodology determinations is 1 December 2010 (i.e., four months prior to the date on which it would take effect); meaning the required consultation process will have to be completed in the five months following 30 June 2010.¹⁷⁷ The Commission also considers this to be the most appropriate date for the deferred adjustment as it is likely to reduce the need for, and magnitude of, any claw-back adjustments. This is likely to provide greater certainty to EDBs as it is the shortest period over which claw-back could be applied. This view was supported by PwC, as set out in paragraph 5.26.
- 5.32 Despite the views expressed by some submitters in paragraph 5.27, the Commission's view is that a 1 December 2010 determination is achievable. The Commission considers that work could be undertaken on some aspects of the adjustments prior to the publication of final input methodology determinations. Doing so would increase the feasibility of the starting price adjustments being completed prior to 1 December 2010. Early indications of the impact of relevant input methodology determinations would be available following the anticipated publication of draft input methodologies determinations in February 2010. The Commission considers that preliminary work could be undertaken on some aspects of starting price adjustments during the first quarter of 2010. This approach will be reflected in the Initial Reset Determination.

¹⁷⁶ supra n 5, section 53P(3)(b).

¹⁷⁷ These dates would apply in the absence of the potential extension for the publication of input methodology determinations allowed under section 52U(2) of the Act.

Draft Decision on Timing of Starting Price Adjustments

5.33 The Commission's draft decision is that any potential adjustment to starting prices should take place after the determination of input methodologies. Further to this, the Commission's view is that the deferred starting price adjustment should, if feasible, be implemented to take effect from 1 April 2011 to align with the 2011/12 pricing year. The proposed process for implementation is set out below.

Table 2 Indicative Process for Starting Price Adjustments¹⁷⁸

Date	Milestone
1 December 2009	Publication of Initial Reset Determination specifying starting prices as those that applied on 31 March 2010
February/March 2010	Process and issues paper published
1 April 2010	Reset DPP comes into effect
30 June 2010	Input Methodologies due to be published
August/September 2010	Consultation on adjustment methodology
Late November 2010	Amended Determination including adjusted starting price published
1 April 2011	Starting price adjustments take effect

5.4 Specification of Starting Prices for the Reset DPP

5.34 As set out above, the Commission proposes to defer starting price adjustments until after the publication of input methodology determinations, currently scheduled for 30 June 2010. The Commission must therefore specify starting prices for the 1 December 2009 determination as those "prices that applied at the end of the preceding regulatory period".¹⁷⁹ The "preceding regulatory period"—in this context—is the assessment year between 1 April 2009 and 31 March 2010, i.e., the period for which the Initial DPP applies.

5.35 The Commission considers there are two main options for specifying prices as at 31 March 2010, either the allowed or actual prices under the Initial DPP. This section sets out the Commission's draft decisions relating to the specification of starting prices for the Reset DPP.

¹⁷⁸ The dates in this table are indicative only. They do not take account of any potential extension to the publication date of input methodology determinations.

¹⁷⁹ *supra* n 5, section 53P(3).

Preliminary Views on Starting Prices for the Reset DPP

- 5.36 The Discussion Paper stated that, given the deferral of starting price adjustments, EDB starting prices should be specified as either:
- those being charged by the EDB as at 31 March 2010 (“Actual Prices”); or
 - the maximum prices allowed under the respective EDB thresholds under the Initial DPP (“Allowed Prices”).
- 5.37 The Commission noted that using Actual Prices might provide a potential incentive for price rises during the Initial DPP. The Commission’s preliminary view was that any risks associated with the use of Actual Prices would be mitigated by contractual constraints and the potential for post breach inquiry. As such, the prices being charged by EDBs as at 31 March 2010 would be appropriate starting prices for the Reset DPP.

Submissions on Starting Prices for the Reset DPP

- 5.38 The majority of submissions to the Process Paper supported the use of Actual Prices.¹⁸⁰ A number went further and specified that these should be defined according to clause 3 of the Thresholds Notice.¹⁸¹ The Commission agrees that such an approach would represent a more transparent and pragmatic approach than the use of Allowed Prices, given the need to derive the latter.
- 5.39 On the issue of intentional breaches, PwC commented that “those that have increased prices above their Initial DPP, and for which the Commission has not taken any remedial action, will continue to be assessed against their actual prices (subject to the annual CPI-X adjustment). If following future profitability assessments, the Commission deems these prices excessive, the claw-back provides the mechanism for resolving this.”¹⁸² The Commission notes that it may open post-breach inquiries into EDBs that breach the Initial DPP.¹⁸³
- 5.40 Submissions to the Discussion Paper supported the Commission’s proposal to use Actual Prices to specify those at the end of the preceding regulatory period.¹⁸⁴ PwC in particular commented that “the use of actual prices as opposed to threshold prices is preferable from an implementation point of view. Threshold prices are only notional, and given they were based on 2003 pricing structures are, for many EDBs, inconsistent with current pricing

¹⁸⁰ Eastland, supra n 96, p. 10. ENA, supra n 93, p. 5; Orion, supra n 36, p. 6; Powerco, supra n 36, p. 3; PwC, *Submission to the Commerce Commission on The Regulatory Provisions of the Commerce Act 1986 Discussion Paper*, 16 February 2009, p. 6; and Wellington Electricity, supra n 112, p. 3.

¹⁸¹ ENA, supra n 93, p. 6; Powerco, *ibid*, paragraph 13; and PwC, *ibid*, paragraph 18.

¹⁸² PwC, *ibid*, paragraph 18.

¹⁸³ supra n 5, sections 54J(3) and 54N.

¹⁸⁴ Eastland, supra n 55, p. 15; Orion, supra n 21, p. 26; PwC, supra n 53, p. 21; Vector, supra n 11, paragraph 75; and Wellington Electricity, supra n 42, p. 12.

practices. Thus actual prices will provide a more transparent assessment process and reduce compliance costs compared with notional threshold prices”.

Commission’s Current View on Starting Prices for the Reset DPP

- 5.41 As discussed in paragraph 5.37, the Commission has considered whether an indication that Actual Prices are to be used might provide an incentive for price rises during the Initial DPP. The Commission’s view is that any such risk is likely to be mitigated by a number of factors. These include contractual constraints (i.e., prices under the Initial DPP have been set prior to the proposal to use Actual Prices), the potential for post-breach inquiry following a breach of the Initial DPP price-path and the use of starting price adjustments under the Reset DPP. As stated in the Discussion Paper starting price adjustments under the Reset DPP are likely to reflect the profit levels of EDBs at the time of the adjustments. These profit levels, in turn, will be influenced by price increases made during the Initial DPP.
- 5.42 The Commission considers the use of Actual Prices—as opposed to prices derived from the Thresholds formula—from an implementation perspective will be more transparent and provide for greater certainty. This view was supported by submissions as discussed in paragraph 5.38.
- 5.43 The Commission further considers that the use of Actual Prices is appropriate as there are potential conceptual and implementation advantages of moving away from a ‘legacy formula’ derived from Allowed Prices. Conceptually, there may be merit in basing the first specification of EDB starting prices under Part 4¹⁸⁵ independently of the price-path mechanism that existed under Part 4A. The alternative, i.e. the use of Allowed Prices (those equating to prices permitted under the Initial DPP), is likely to require a definition that reflects the thresholds formula, as it would be based on prices allowed by that formula.

Draft Decision on Starting Prices for the Reset DPP

- 5.44 The Commission’s draft decision is that starting prices for the Reset DPP will be those that applied at the end of the Initial DPP and that they should be specified as the Actual Prices posted by each EDB as at 31 March 2010. The role of starting prices when assessing price-path compliance is discussed in paragraph 4.81.

¹⁸⁵ Noting that starting prices were implicitly specified when the Thresholds Notice was deemed to be a section 52P determination for the Initial DPP. The Reset DPP represents the first opportunity to explicitly specify an updated basis for starting prices.

CHAPTER 6: RATE OF CHANGE

6.1 This chapter sets out the Commission’s draft decision on the rate of change to be applied to EDBs under the Reset DPP. This draft decision takes into account submissions received on the Process and Discussion Papers, as well as results from productivity analyses and a number of other factors.¹⁸⁶

6.1 Introduction

6.2 Under a DPP, the Commission must set a rate of change (“X-factor”) for EDB prices (CPI adjusted) during the regulatory period.¹⁸⁷ The X-factor must be based on the long-run average productivity improvement rate achieved by suppliers of the relevant services in New Zealand, and/or in other comparable countries, and may also take into account the effects of inflation on the inputs of suppliers.¹⁸⁸

6.3 This chapter discusses the following:

- *Rate of Change under the Reset DPP*: the context for setting the rate of change, and the appropriate form of productivity analysis;
- *Overall Approach to Setting the X-Factor*: the relative merits of alternative approaches to total factor productivity (“TFP”) analysis taken into account in the setting of the X-factor;
- *Industry TFP Growth Rate*: the appropriate input and output specification for industry-wide TFP analysis (including the asset value series used to form the user cost of capital);
- *Input Price Differential*: the appropriate treatment of input price differentials between the industry and the economy;
- *Analyses of EDB Productivity*: analyses of EDB productivity growth undertaken for the Commission by Economic Insights,¹⁸⁹ and undertaken for ENA by Pacific Economics Group¹⁹⁰ (“PEG”), which both provide recommendations for the X-factor within a similar range; and

¹⁸⁶ These factors are discussed in paragraphs 6.55-6.59.

¹⁸⁷ The Commission has adopted the term X-factor to represent the ‘X’ component of the CPI-X indexation component of the price-path. While the overall rate of change in weighted average prices under the DPP will, in practice, be CPI-X%, the Commission notes that section 53P(5) provides an example that refers to the “rate of change” as being solely the “X” in “a CPI-X” path. This chapter focuses on how the X-factor component of the CPI-X price path is derived. The approach to incorporating the CPI is discussed in Chapter 4.

¹⁸⁸ supra n 5, section 53P(5) to (7).

¹⁸⁹ Economic Insights (2009c), *Electricity Distribution Productivity Analysis: 1996-2008*, Report by Denis Lawrence, Erwin Diewert, John Fallon and John Kain to the Commerce Commission, Canberra, 1 September 2009.

¹⁹⁰ Pacific Economics Group, *X Factor Recommendations for New Zealand Electricity Distribution Price Controls*, Report for ENA, July 2009.

- *Draft Decision on the Rate of Change*: the Commission's draft decision is that the common X-factor to apply to all EDBs under the Reset DPP should be 0%.¹⁹¹
- 6.4 The productivity analyses that the Commission has considered in making its draft decision on the X-factor reflect past EDB performance. The focus on *past* performance is for two key reasons. First, as noted above, there is a legislative requirement that the X-factor must be based on the long-run average productivity improvement rate *achieved* by the EDBs (or by suppliers in other comparable countries). This necessitates a focus on past performance. Secondly, even in the absence of such a requirement, it is difficult to forecast likely future productivity changes. Nonetheless, although the rate of change is to be based on past productivity improvement rates, the Commission notes that the incentives on EDBs created by the X-factor in the CPI-X price path are intended to be forward-looking, for the long-term benefit of consumers. Consequently, the Commission has not mechanically derived the X-factor from any specific analysis of past productivity. Rather, the Commission's draft decision on the X-factor involves an exercise of regulatory discretion which has been informed by a number of productivity analyses of past EDB performance and the Part 4 Purpose.
- 6.5 In the Discussion Paper, the Commission proposed a number of refinements to the productivity analysis that had been used when setting the Thresholds B-factor, the component of the overall X-factor that, at that time, reflected expected improvements in industry-wide productivity, relative to the economy (see paragraph 6.31). The proposed refinements were informed by two research reports prepared for the Commission by Economic Insights, which were released with the Discussion Paper.¹⁹² The Commission engaged Economic Insights to consider a number of issues associated with applying TFP analysis in the context of default/customised price-quality regulation.
- 6.6 The Commission further engaged Economic Insights to assess EDB productivity during the period 1996-2008,¹⁹³ to inform the Commission's draft decision on the appropriate X-factor under the Reset DPP

¹⁹¹ As the X-factor reflects the difference between industry-wide and economy-wide productivity, a zero X-factor does not imply a lack of expected productivity improvements. Rather, an X-factor of zero means, assuming an input price differential of zero, that the EDBs are expected to improve their productivity performance by at least the same rate as the economy as a whole.

¹⁹² Economic Insights (2009a), *Asset valuation and productivity-based regulation taking account of sunk costs and financial capital maintenance*, Report by Erwin Diewert, Denis Lawrence and John Fallon to the Commerce Commission, Canberra, 11 June 2009; and Economic Insights (2009b), *The theory of network regulation in the presence of sunk costs*, "Technical Report" by Erwin Diewert, Denis Lawrence and John Fallon to the Commerce Commission, Canberra, 8 June 2009.

¹⁹³ These dates represent the extent of the time-period for which sufficient, reliable data exists. As long a period as possible was initially considered to reflect the long run provision in the Act.

(“Productivity Report”).¹⁹⁴ Economic Insights’ Productivity Report is being released with this Draft Decisions Paper, along with the data and models used in its productivity analyses.¹⁹⁵

- 6.7 Although the Commission considers that Economic Insights’ methodological approach better reflects the characteristics of the industry being analysed, in making its draft decision on the X-factor, the Commission has also taken into account the productivity analyses undertaken by PEG for ENA. Both Economic Insights’ and PEG’s analyses involve simplifying assumptions, and these assumptions differ in a number of respects. The Commission notes, however, that its proposed X-factor of 0% lies within the ranges for the X-factor recommended by both Economic Insights and PEG.

6.2 Rate of Change under the Reset DPP

Setting the X-factor

- 6.8 For regulated suppliers subject to a DPP, the Commission must set a single X-factor per type of regulated service.¹⁹⁶ As noted above, the X-factor must be based on the “long-run average productivity improvement rate” achieved by suppliers of the relevant services in New Zealand and/or in other comparable countries. The Commission may use whatever measures of productivity it considers appropriate.¹⁹⁷ The Commission may also take into account the effects of inflation on supplier inputs when setting an X-factor.¹⁹⁸

Form of Productivity Analysis

- 6.9 Regulators in a number of jurisdictions (including Australia, the US, the UK and Canada) use TFP analysis to inform their decisions on appropriate levels for X-factors used under CPI-X price control regimes. In a more general sense, TFP analysis is a well-established analytical tool for estimating the past performance of an economy or of a particular industry.
- 6.10 Both the Commission and EDBs have had experience with the use of TFP analysis to measure productivity growth rates under the Thresholds. In the

¹⁹⁴ Economic Insights, supra n 189.

¹⁹⁵ Commissions website, refer: <http://www.comcom.govt.nz/IndustryRegulation/Electricity/PriceQualityPaths/20102015defaultpri cepath.aspx>

¹⁹⁶ The rate of change (“X-factor”) is discussed in detail in Chapter 6. The Commission must, in general, set a single X-factor for all EDBs (in accordance with section 53P(5)). The Commission may however set an alternative X-factor for individual EDBs following a price adjustment or as a quality incentive (as provided for under section 53P(8)). As discussed in paragraphs 5.33, the Commission’s draft decision is to adjust starting prices following the publication of input methodology determinations. Given that section 53P(8)(a) only relates to adjusted starting prices and in the absence of priced-based quality incentives, the Commission considers that alternative X-factors are not appropriate for the Initial Reset Determination.

¹⁹⁷ supra n 5, section 53P(6).

¹⁹⁸ *ibid*, section 53P(7).

Discussion Paper, the Commission proposed using TFP analysis to assess the long-run average productivity improvement rate achieved by EDBs in New Zealand.

Economic Outlook and Other Factors

- 6.11 Historic-based productivity measures use data that reflects past economic conditions. Such data may not reflect future economic conditions that might be experienced during the Reset DPP period. In particular, the current economic climate is considerably worse than that experienced in the past years for which data is available (1996 to 2008).
- 6.12 The Commission considers that measures of productivity used to set the X-factor must, in accordance with the underlying conceptual basis of CPI-X regulation, reflect the *difference* in productivity between the economy and that achieved by EDBs (e.g., paragraph 6.31 below). Changes in the economic climate will only affect the X-factor to the extent that they have different effects on TFP improvement in the EDB sector than the effect they have on TFP improvement for the economy as a whole.
- 6.13 More generally, a key issue in using past long-run productivity improvement rates (or strictly speaking differential rates of productivity improvement) as the basis for setting X-factors over the coming regulatory period is the extent to which past performance can be considered a good guide to expected future performance.
- 6.14 The Commission concluded in the Discussion Paper that factors such as the current economic climate act as a reminder that, in setting a rate of change, the results from any analytical technique such as TFP should not be mechanistically applied. Rather, the Commission proposed using the results of TFP analysis based on past productivity to *inform* its thinking, with those results given appropriate weight in light of other relevant considerations.

Submissions on Productivity Analysis and Setting the X-Factor

- 6.15 Where the issue was addressed, submissions supported the use of TFP analysis to inform the setting of the X-factor for the Reset DPP. For instance, PwC stated that: “We accept in principle the concept of TFP to determine an industry wide productivity factor for the purpose of the DPP. We believe this is consistent with incentive based regulation, and that EDBs which improve productivity faster than forecast should be able to earn higher profits at least until the end of the regulatory period”.¹⁹⁹
- 6.16 While supportive of the use of TFP, submissions generally advised against mechanically applying the results of any TFP analysis. In its submission PwC stated that “the Commission should not mechanistically apply the

¹⁹⁹ PwC, *supra* n 53, p. 28.

results from any analytical technique such as TFP in determining the X-factor”.²⁰⁰

- 6.17 Similarly, Orion submitted that, in assessing aggregate productivity, the Commission “should not mechanistically apply the results from any single analytical technique ... it should use the results of any such analysis to inform its thinking, with those results given appropriate weight in light of other considerations.” Orion noted that the Commission is given “a broad discretion under s53P(6) to take into account ‘whatever measures of productivity’ it considers appropriate” and that “it is for the Commission to judge how much pressure to reasonably place on EDBs to achieve efficiency gains, rather than to simply assume that the mechanical application of an analytical technique will yield a ‘fair’ rate of change.”²⁰¹
- 6.18 EDB submissions voiced concerns about the ability of productivity analysis of past performance to forecast the future productivity growth of the industry, particularly given the current economic climate. For instance, PwC and Wellington Electricity suggested that the current economic climate makes it difficult to predict the electricity sector’s performance relative to the economy as a whole, and therefore the Commission needs to adopt a cautious approach when considering industry-wide productivity expectations.²⁰² Powerco submitted that the current economic climate needs to be taken into account in assessing current and future profitability and in measuring total factor productivity and translating this to the X factor. Powerco also noted that the purpose of the Commission’s exercise is to set a path for prices, and not to obtain the best estimate of TFP, per se.²⁰³
- 6.19 Vector also urged the Commission to adopt a cautious approach when setting X-factors. It stated that the consequences of setting an X-factor too low would be a delayed sharing of efficiency gains with consumers until the next reset, and setting the X-factor too high would create disincentives for investment.²⁰⁴ Aurora considered that the downside risks to consumers from taking a cautious approach were low.²⁰⁵

Use of International Productivity Data

- 6.20 In the Discussion Paper, the Commission set out its preliminary view that international data should not be directly incorporated into the productivity analysis used to inform the rate of change for EDBs. Nevertheless, the Commission stated that it might be appropriate to consider the use of

²⁰⁰ PwC, supra n 53, p. 27.

²⁰¹ Orion, supra n 21, paragraphs 41-42.

²⁰² PwC, supra n 53, p. 27; and Wellington Electricity, supra n 42, p. 8.

²⁰³ Powerco, supra n 15, p. 17.

²⁰⁴ Vector, supra n 11, paragraph 8.

²⁰⁵ Aurora, supra n 19, p. 11.

international data to help assess whether the findings from its analysis of New Zealand EDB productivity are reasonable.

Submissions on the Use of International Data

- 6.21 Submissions were mixed in their views on the use of international productivity data. Auckland Electricity Consumer Trust (“AECT”) and Unison did not support the use of international data. Unison was of the view that it could “not see how it is rational for international data to be used as a check for ‘reasonableness’ of the results of New Zealand data which is specifically designed for New Zealand purposes”.²⁰⁶
- 6.22 On the other hand, Vector endorsed the Commission’s recognition that international data could be used as a sense check,²⁰⁷ and Orion submitted that the Commission should “avail itself of international data to supplement the New Zealand series; at a minimum, the data should be used to cross-check the refined TFP results and ensure they are in the ballpark”.²⁰⁸ MEUG suggested that, before ruling out the use of international productivity data in the Determination formula, the Commission undertake a more thorough analysis.²⁰⁹

Commission’s Current Views on the Rate of Change under the Reset DPP

- 6.23 The Commission continues to agree with interested parties that the rate of change for all EDBs under the Reset DPP should not be set through the mechanistic application of any form of productivity analysis such as TFP. While the rate of change must be *based* on the long-run average productivity improvement rate achieved by regulated suppliers of the relevant services in New Zealand and/or comparable countries, the Commission must also set the rate of change having regard to the overall Part 4 Purpose.
- 6.24 The incentives on EDBs created by setting an X-factor are forward-looking, to promote the long-term benefit of consumers. Given the difficulty of deriving assessments of likely future productivity changes (i.e., for the EDB sector relative to the economy), the estimates for the long-run average productivity improvement rates use backward-looking data. The Commission acknowledges that assessments of past productivity growth improvements are not necessarily an accurate guide to future productivity gains, particularly over relatively shorter time periods.
- 6.25 New Zealand’s EDB industry as a whole may be at a different stage of its investment cycle from those in other comparable countries. Therefore, information from those countries may have limited value except in cases where it is required to supplement limited relevant information available in a

²⁰⁶ Unison, supra n 41, p. 24.

²⁰⁷ Vector, supra n 11, paragraph 108.

²⁰⁸ Unison, supra n 21, paragraph 40.

²⁰⁹ MEUG, supra n 55, paragraph 17.

New Zealand context. Furthermore, within the New Zealand industry, different EDBs will likewise be at different stages of their investment cycles. In the absence of any thorough analysis, due to the unavailability of relevant information, an appropriate starting point may be to assume that the EDBs can achieve the same TFP gain as the average for the economy as a whole.

- 6.26 The Commission notes that incentives on EDBs under the Reset DPP are not only provided by the common rate of change, but will also be provided by the starting price adjustments and quality standards. While the Commission understands the advocacy of EDBs for a cautious approach to setting the X-factor given its generic nature, starting prices and quality standards potentially provide for more business-specific considerations.
- 6.27 In addition, the Commission notes the Act, in providing for the CPP mechanism, contemplates that DPP provisions may not be able to appropriately take into account short- to medium-term business-specific factors such as differences in the investment cycle. The provision that EDBs can propose an alternative CPP that better meets their particular circumstances acts as a ‘safety net’ in the event that the common rate of change, in combination with the other elements of the DPP, is not set at an appropriate level for a particular EDB.
- 6.28 Overall, the Commission considers that its choice of an appropriate X-factor will include a degree of regulatory discretion. That choice should be made in light of the Part 4 Purpose and informed by an appropriate assessment of relevant long-run average productivity improvement rates.

6.3 Overall Approach to Setting the X Factor

Thresholds B-Factor Formula

- 6.29 The traditional formula used to establish the X-factor in CPI–X productivity-based regulation, where TFP is used, was set out in the Discussion Paper.²¹⁰

Formula 4 Traditional TFP X-factor Formula

$$X \equiv [\Delta TFP - \Delta TFPE] - [\Delta W - \Delta WE] - \Delta M$$

- 6.30 In Formula 4, the X-factor comprises three components:
- the first differential term is the difference between the industry-wide trend TFP growth rate and the trend TFP growth rate for the economy as a whole (i.e., the E subscript refers to the economy as a whole);
 - the second differential term is the difference between the change in input prices for the industry and the change in input prices for the economy as whole; and

²¹⁰ Also refer: Lawrence D. (2003), *Regulation of Electricity Lines Business Performance – 1996-2003*, Report prepared by Meyrick and Associates for the New Zealand Commerce Commission, Canberra, 19 December 2003.

- the ΔM is the monopolistic mark-up term, and is an adjustment for profits above or below those that would provide a normal return.

6.31 For the purposes of setting Thresholds for EDBs from April 2004, the Commission used the above formula to establish a common ‘B-factor’ for all EDBs. The B-factor was used to reflect expected industry-wide improvements in productivity. The B-factor was defined as the X-factor in Formula 4, but without the ΔM term.

Formula 5 Thresholds B-Factor Formula

$B \equiv [\Delta TFP - \Delta TFPE] - [\Delta W - \Delta WE]$
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- 6.32 The B-factor did not include the monopolistic mark-up term because the profitability of individual EDBs was taken into account using a separate factor (i.e., C_2 -factor), which was added to the B-factor as part of deriving an overall X-factor.
- 6.33 At the time of setting the Thresholds, the Commission considered that the best estimate of industry-wide TFP trend rate, based on EDB input/output data from 1996-2002, was 2.1%. The corresponding estimate of the economy-wide TFP trend rate was 1.1%, leading to a 1% estimate for the first differential term above. Given conflicting information from official input price indices, the Commission considered it appropriate to adopt an input price differential between the distribution industry and the economy of 0%, leading to an overall B-factor for all EDBs of 1%.
- 6.34 In the Discussion Paper, the Commission indicated that it considered the TFP methodology used to derive the B-factor should form the basis of the productivity analysis to be used under the Reset DPP.²¹¹ The Commission acknowledged, however, that there were a number of methodological issues with the implementation of the B-factor under the Thresholds.
- 6.35 The Commission therefore proposed introducing a number of refinements to the methodology to be used under the Reset DPP:
- amending the B-factor formula to take into account the sunk cost-nature of the electricity distribution industry and to be more consistent with the concept of financial capital maintenance (paragraphs 6.37-6.45) which, among other things, involved amending the way the input price differential is accounted for (paragraphs 6.88-6.90);
 - changing the definition of the system capacity measures used as part of the TFP output specification (paragraphs 6.60-6.65); and
 - using an indexed historic cost (“IHC”)-based asset value series to derive the user cost of capital (paragraphs 6.76-6.78).

²¹¹ Commerce Commission, *supra* n 16, p.87.

Submissions on the B-Factor Formula

- 6.36 The majority of submissions, in principle, supported the continued use of the B-factor approach (i.e., Formula 5), for setting the X-factor under the DPP. For instance, Aurora stated that it “continues to support the use of TFP in a conventional B-factor sense for setting the rate of change under the DPP”.²¹² Vector also expressly stated its support of the B-factor framework to set the rate of change.²¹³ While acknowledging that the former B-factor was not perfect, AECT considered the B-factor approach to be consistent with the intent of the DPP to provide a low cost regulatory option.²¹⁴

Preliminary Views on an Amended TFP X-factor Formula

- 6.37 The Discussion Paper highlighted that the traditional TFP X-factor formula above, which was used to derive the B-factor for the Thresholds, implicitly assumes that no assets are sunk. Whilst the Commission recognised that the above formulation is commonly used by regulators in determining X-factors, the Commission’s view was that, if possible, it would be reasonable to take into account an appropriate treatment of sunk costs. It also signalled its intention to approach the exercise in a manner consistent with the real financial capital maintenance (“FCM”) concept. Real FCM means that a regulated firm is compensated for its efficient investments and other expenditure such that, on an *ex ante* basis, its financial capital is at least maintained in present value terms, taking account of inflation.²¹⁵
- 6.38 As noted above (paragraph 6.4), the Commission engaged Economic Insights to consider a number of issues associated with applying TFP analysis in the context of default/customised price-quality regulation. In particular, the Commission asked Economic Insights to consider how to account for sunk costs and the FCM concept within TFP analysis.

²¹² Aurora, *supra* n 19, p. 15.

²¹³ Vector, *supra* n 11, paragraph 8(b).

²¹⁴ AECT, *Submission to the Commerce Commission on the 2010 Reset of Default Price-Quality*, 17 July 2009, p. 12.

²¹⁵ The proposed role of Financial Capital Maintenance (FCM) in Part 4 is discussed in Chapter 2 of the *Input Methodologies Discussion Paper*. (Refer to Commerce Commission, *supra* n 64).

6.39 The Discussion Paper set out the following amended X-factor formula, developed by Economic Insights.

Formula 6 Amended TFP X-factor Formula

$X \equiv \{[C/R] \Delta TFP - \Delta TFP_E\} - \{[C/R](s_X \Delta w_X + s_K \Delta P_{KD}) - \Delta W_E\} + \{[\Pi/R] \Delta Y - \Delta \Pi/R\}$ <p style="margin-left: 20px;">= TFP differential growth rate term</p> <p style="margin-left: 40px;">– input price differential growth rate term²¹⁶</p> <p style="margin-left: 40px;">+ non-zero profits adjustment term</p> <p style="margin-left: 40px;">– rate of change of regulated profits term</p>

6.40 As was explained in the Discussion Paper:

- the first term is the differential rate of TFP growth between the regulated firm, ΔTFP , and the rest of the economy, ΔTFP_E . By contrast to Formula 4, the TFP growth rate of the regulated firm is now weighted by the ratio of the regulated firm's costs (including the cost of capital), C , to its revenues, R , and the weight applied to capital is now the amortisation charge rather than the former user cost proxy;
- the second term is the equivalent input price differential growth rate term. It comprises: C/R times a share weighted rate of the growth of opex input prices for the regulated firm, Δw_X , and the rate of growth of allowable amortisation charges for sunk cost capital inputs, ΔP_{KD} (not the standard user costs which use capital goods prices in the traditional formula); less, the rate of growth of input prices in the rest of the economy, ΔW_E . The total cost for the regulated firm, C , is defined as the sum of variable or opex input costs plus allowable amortisation costs for sunk cost capital inputs. The regulated firm input cost shares which appear in the input price differential term, s_X and s_K , are defined as the ratio of variable or opex cost to total cost and the ratio of allowable amortisation costs to total cost, respectively (where $s_X = (1 - s_K)$); and
- the final term involves the level of above-normal profits of the regulated firm, Π (where $\Pi = R - C$), the rate of change of above-normal profits, $\Delta \Pi$, and output, Y .

²¹⁶ Note that in the Discussion Paper, the overall input price differential term was presented as a positive value. This alternative way of presenting the formula, as the difference of two differentials, provides identical results. However, this alternative version of the formula means that the values for each differential term can be presented on the same basis (i.e., with the same sign) as the equivalent terms in the B-factor formula.

- 6.41 Formula 6 implicitly assumes that all changes in prices will occur through the X-factor alone. This would be relevant in its entirety were the Commission unable to undertake starting price adjustments. Given, however, that under the DPP reset the Commission proposes to undertake starting price adjustments on a business-specific basis, the Commission proposed in the Discussion Paper that when implementing the approach, the terms would be set such that C would be assumed equal to R. As a result, the ratio term C/R would equal 1. Doing so would also mean that the final term relating to profits is not included, just as the monopolistic mark-up term was not included in the Thresholds B-factor because profitability adjustments were implemented through the separate C₂-factor. The Commission noted that setting R = C, and excluding the profit-related term, would simplify the formula and ease its implementation.
- 6.42 As a result, the differential rate of TFP growth term would remain largely unchanged from the previous TFP approach (except for the use of an amortisation charge instead of the former user cost proxy). Economic Insights' (2009b) showed that to set the amortisation charge for capital inputs would involve a similar process to that currently used in building blocks regulation. This is necessary in order for the productivity analysis to appropriately take into account sunk costs and for consistency with FCM. That is, the initial regulatory asset base would be taken as the starting point and, along with subsequent capital additions, would be amortised over the weighted average asset life to satisfy *ex ante* FCM.
- 6.43 With the profit-related term set to zero, the main difference between the proposed amended TFP X-factor formula and the B-factor formula would be in the input price differential term. Issues associated with the input price differential term are discussed below in paragraphs 6.88-6.95.
- 6.44 In the Discussion Paper, the Commission indicated that it considered the amended TFP X-factor formula would provide a theoretically more appropriate model. It would allow for a more accurate representation of the characteristics of the regulated suppliers' assets under consideration, given that they involve a high proportion of sunk costs, as well as being more consistent with FCM. In practice, the most material effect of the proposed TFP approach is likely to be on the input price differential term, as it takes into account the fact that businesses do not face increasing costs for assets that are already sunk.
- 6.45 The Commission acknowledged, however, that Formula 6 was "new and untested", and therefore it would continue to consider any implementation issues associated with using the amended formula. In addition, the Commission indicated that it would be likely to also apply the standard TFP approach in Formula 4, as a check on the amended approach.

Submissions on the Amended TFP X-factor Formula

- 6.46 MEUG submitted that the amended TFP formula is worth investigating,²¹⁷ and Unison was of the view that “[t]he incorporation of sunk capital costs into the calculation of the X factor is a significant improvement over the methodology employed under the thresholds regime”.²¹⁸ Specifically, Unison welcomed the Commission’s recognition of sunk costs as they represent a large uncontrollable part of an EDB’s cost base.²¹⁹ Nevertheless, Unison also submitted that “the proposed methodology is untested, relies on a novel and meaningless measure of capacity, and has not been employed in any other regulatory jurisdiction.”²²⁰
- 6.47 Likewise, submissions from other EDBs generally opposed the introduction of the proposed refinements to the TFP methodology presented by Economic Insights. A number of submissions were of the view that Economic Insights’ proposed TFP method lacked the necessary level of transparency to provide EDBs with an effective understanding of the proposed methodology. Submissions also voiced concern regarding the perceived availability of data to derive a robust productivity measure under the proposed amended method.
- 6.48 For instance, ENA and PwC submitted that “the Economic Insights material appears to us to be more suited to academic research than to the task at hand.”²²¹ Similarly, PwC submitted that “the proposed methodology is highly complex and presented in a highly academic manner which makes it very difficult for EDBs to respond in a meaningful way.”²²² Powerco questioned “the merit of the Commission seeking to reinvent the theory of price cap regulation and the measurement of total factor productivity in the context of determining the DPP when tried and true methods (albeit, which may be approximations) exist.”²²³
- 6.49 In an appendix to Orion’s submission, NERA referred to the “utter incomprehensibility of [Economic Insights’] theoretical discussion for anyone outside of the small circle of academic and consulting economists already familiar with the complex subject areas of index number theory and productivity measurement.”²²⁴ NERA disagrees with Economic Insights’ “central theme that the presence of sunk costs calls into question the validity of the traditional methods for finding the X-factor.”²²⁵ NERA concludes that

²¹⁷ MEUG, *supra* n 55, paragraph 16.

²¹⁸ Unison, *supra* n 41, paragraph 3.

²¹⁹ *ibid*, p. 24.

²²⁰ *ibid*, paragraph 3.

²²¹ ENA, *supra* n 18, paragraph 60.

²²² PwC, *supra* n 53, paragraph 5.

²²³ Powerco, *supra* n 15, paragraphs 17.

²²⁴ Orion, *Submission on Economics Insights Papers*, 31 July 2009, p. 13.

²²⁵ *ibid*, p. 16.

Economic Insights' reports "ultimately give no assistance to the Commerce Commission in its job to set reasonable electricity prices that balance the often-competing interests of utility owners and utility customers," and that "the empirical work called for in [Economic Insights'] extended theory lies completely beyond the ability of the available data to make into an objective and usable method for controlling regulated prices."²²⁶

- 6.50 ENA commissioned PEG to provide a critique of Economic Insights' proposed TFP approach.²²⁷ In addition, ENA also commissioned PEG to prepare a separate report on New Zealand EDB productivity. This latter report also explains PEG's view as to why PEG's preferred analytical approach to TFP—which is founded on Formula 5 (i.e., without the ΔM monopolistic mark-up term) and on the use of financial rather than physical input and output quantities—is more appropriate than Economic Insights' proposed TFP approach.²²⁸
- 6.51 PEG stated that the indexing logic (which underpins the original B-factor formula) has a strong analytical foundation. It relies on the competitive market paradigm, and starts from the premise that, in the long run, the trend in revenues for an industry equals the trend in its costs.²²⁹ In response, Economic Insights argues that "there is a big difference in assuming a framework that relies on assumptions that a competitive market exists, as PEG does, and developing a framework that takes account of relevant characteristics not consistent with a competitive market in order to provide guidance on appropriate regulatory decisions to help achieve conditions consistent with a competitive market outcome".²³⁰
- 6.52 Economic Insights agrees that the competitive market paradigm underpins the traditional TFP X-factor formula but highlights that, as a result, the traditional formula assumes there is competitive price taking behaviour (i.e., prices equal marginal costs) and there are constant returns to scale. Although these assumptions do result in the conclusion that revenues cover costs (consistent with FCM), this is only because, where there are constant returns to scale, marginal and average costs will be equal.²³¹
- 6.53 Economic Insights argues that neither these underlying assumptions, nor the resultant conclusion about revenues equalling costs, are valid for industries with natural monopoly characteristics. First, there are likely to be economies of scale and scope arising from sunk costs, and therefore average costs will

²²⁶ *ibid*, paragraphs 12-13 and 17.

²²⁷ Pacific Economics Group, *Reset of Default Price Path for Electricity Distribution Businesses: Submission to the Commerce Commission*, Report for ENA, August 2009.

²²⁸ PEG, *supra* n 190, Appendix 1 and 2.

²²⁹ *ibid*, pp. 38-39.

²³⁰ Economic Insights, *supra* n 189, p. 47.

²³¹ *ibid*, p. 48.

exceed marginal costs. Secondly, average prices are unlikely to track average costs (including the cost of capital) over the long run, unless regulatory arrangements are explicitly intended to achieve such an outcome. It was because the Commission recognised these shortcomings in the assumptions underpinning the traditional TFP X-factor formula that Economic Insights was engaged to prepare its earlier research and technical reports.

- 6.54 Economic Insights also highlights that even the traditional TFP X-factor formula, as expressed in Formula 4, recognises that revenues might not equal costs, through the monopolistic mark-up term, ΔM . PEG's approach does not acknowledge the need for such a term. Consequently, Economic Insights argues that PEG's TFP formulation simply provides an accounting identity that can be consistent with either significant monopoly profits or with significant economic losses; outcomes which would be inconsistent with FCM.²³²

The Commission's Current Views on the Approach for Setting the X-factor

- 6.55 The Commission recognises the concerns expressed by a number of EDBs about the apparent complexity and lack of transparency in respect of the proposed refinements to the TFP approach. The Commission acknowledges the challenges faced by submitters in providing views on the proposed approach in the abstract, particularly without seeing examples of how the amended TFP X-factor formula and related refinements can be implemented in practice.
- 6.56 The Commission notes that both PwC's and PEG's August reports did critique detailed aspects of Economic Insights' (2009b), and it welcomes the input provided by these parties. PwC (submitting for Powerco) was able to identify an error in the Technical report,²³³ and it acknowledged that Economic Insights' analysis yielded a number of interesting insights. In particular, PwC explained the intuition for the terms in the equation underpinning Formula 6.²³⁴
- 6.57 The Commission considers that the release of Economic Insights' Productivity Report (discussed at paragraphs 6.96-6.113 below) should assist interested parties to understand how the revised TFP approach can be implemented in practice. As Formula 6 is implemented without the profit terms (given that divergent profitability levels can be addressed through starting price adjustments), Formula 6 comprises similar differential terms as the former Thresholds B-factor formula (i.e., Formula 5). Furthermore, the

²³² *ibid*, p. v and 51.

²³³ PwC's report to Powerco, *Comments on the Reports by Economic Insights about the use of TFP in Price Cap, August 2009*, ("PwC Powerco Report"), footnote 5. Economic Insights agrees that PwC has correctly identified an incorrect sign in formula (278) of its Technical Report (refer to Economic Insights, *supra* n 192).

²³⁴ PwC Powerco Report, *ibid*, p. 10.

amended approach is no more data intensive than that used in deriving the B-factor.

- 6.58 Although implementing the amended TFP X-factor formula requires a number of assumptions, such as appropriate input and output specifications and weights, the use of such assumptions is not avoided by using the traditional formula. Specifically, the traditional formula is underpinned by a number of assumptions that are not applicable to EDBs—notably that the relevant markets are perfectly competitive and that capital is perfectly fungible.
- 6.59 Therefore, the Commission’s view is that it is appropriate to consider the long-run average productivity improvement rates for EDBs suggested by the revised TFP approach. The Commission considers, however, that it is useful to also undertake a productivity analysis using the former B-factor approach as well. This will allow the impact of the refinements to be understood individually and in combination, and will provide a check on the results found from using the amended TFP X-factor approach. In addition, the Commission has received a report by PEG on EDB productivity, commissioned by ENA (see paragraph 6.50). PEG uses the B-factor formula, but has adopted a different approach to defining the inputs and outputs to that used by Economic Insights. The Commission has taken PEG’s report into account in making its draft decision on the X-factor.

6.4 Industry TFP Growth Rate

Input/Output Specification and Weights

- 6.60 TFP indices are a commonly used technique to derive estimates of past economy-wide and industry level productivity performance, although econometric methods can also be used to derive trend TFP growth rates. The TFP index is essentially a weighted average of changes in output quantities relative to a weighted average of changes in input quantities. This weighting of inputs and outputs is necessary because economies and most industries have a diverse range of outputs. Growth rates for individual outputs and inputs are weighted together using revenue or output cost shares and input cost shares, respectively.
- 6.61 A key challenge in calculating TFP for the electricity distribution industry is the appropriate specification of EDB inputs and outputs, and the measurement of the quantity and value of each of those input and outputs. Indices can be constructed directly using physical quantities or indirectly using financial (i.e., constant dollar) measures of the input and output quantities.
- 6.62 In setting the B-factor for the Thresholds, the Commission applied a direct approach based on physical input and output quantities. The three output quantities the Commission used were: energy delivered (measured in kWh), system capacity (measured in MVA-km of lines), and the number of

consumer connections.²³⁵ These diverse outputs needed to be combined into an aggregate output index by allocating a weight to each output. For most competitive industries which produce multiple outputs these output weights are taken to be the revenue shares. However, for EDBs, disaggregated revenue data are not always readily available. Therefore, in deriving the B-factor, the revenue shares were weighted, based on the estimated output cost shares derived from an econometric distribution cost function.

- 6.63 Five input quantities were used: operating expenditure; overhead MVA-km; underground MVA-km; kVA of installed transformers; and other assets. The value for total costs was formed by summing the estimated value of operating expenditure, and a fixed percentage (i.e., 12.5%) of disclosed EDB ODV, reflecting the user cost of capital (i.e., depreciation and return on investment). The weight given to opex was therefore its share of total cost, whereas the weights given to the three capital components were the shares of each component in the ODV multiplied by the overall capital share of total cost.²³⁶
- 6.64 In the Discussion Paper, the Commission highlighted that two criticisms of the TFP output and input specification used in setting the B-factor were: (a) the system capacity output measure, which included line capacity but did not include transformer capacity; and (b) line capacity as measured by MVA-km appeared as both input and output variables. The Commission considered that one way to address these criticisms was to use an alternative system capacity output measure.
- 6.65 The Commission's proposed alternative was to use the product of installed distribution transformer capacity and line length. This was chosen because, among other things, transformer kVA-km recognises the contribution of transformer capacity to system capacity, and removes the use of the same (component) measures on the output and input side of the TFP index.²³⁷ The Commission proposed deriving this measure from the simple product of the installed distribution transformer kVA capacity (at the last level of transformation), and the cumulative line length (inclusive of lines at all voltages, but excluding street-lighting and communications lengths).²³⁸

²³⁵ The MVA–kilometres system capacity output measure used under the thresholds regime included the summation of line length kilometres at various voltages weighted by a capacity factor appropriate to each voltage.

²³⁶ At the time the 2004 thresholds for EDBs were set, disaggregated ODV data for each of the three types of capital components were not available for all EDBs individually. Hence, capital cost shares for the input quantities were weighted by disaggregated ODV data averaged across four groups of businesses, classified as urban or rural, and as having high or low energy density.

²³⁷ While the transformer capacity could also be expressed in terms of MVA-km, 'kVA-km' is used to more readily distinguish the transformer capacity measure from the line capacity measure.

²³⁸ Street-lighting was excluded due to inconsistencies in the line length data of a number of EDBs.

Submissions on Input/Output Specification and Weights

- 6.66 AECT and Unison supported, in principle, the Commission's intention to improve the input and output specification that had been used in setting the B-factor. But, consistent with other submitters, they expressed concerns about the proposed transformer kVA-km output measure.²³⁹
- 6.67 For instance, Vector made a number of criticisms of the proposal to use the transformer kVA-km output measure; one being that this output measure also appears as an input measure. Vector further argued that an EDB's apparent productivity could be increased, simply by installing more transformers. Vector proposed that the Commission use an output measure based on the product of peak demand and line length instead.²⁴⁰
- 6.68 Economic Insights notes that the inclusion of transformer capacity as an input, and including measures of energy delivered and consumer connections as outputs, limits the ability of firms to increase TFP by simply installing more distribution transformers. In addition, Economic Insights highlights that, in principle, the input and output measures involving transformer capacity are effectively different. This is because the output capacity measure is intended to only reflect the final stage of transformation (i.e., distribution transformers, but not zone substations), whereas the input measure is intended to reflect both.²⁴¹ Also, on the output side, the measure is transformer kVA-km, whereas on the input side, the measure is just transformer kVA.
- 6.69 In practice, however, the available EDB data currently includes only distribution transformer information (i.e., at the final stage of transformation). Economic Insights observes that excluding the zone substation kVA information (given its unavailability) from the input measure will be conservative in favour of the EDBs, as long as distribution transformer capacity has increased at a faster rate than zone substation capacity.²⁴²
- 6.70 Both PEG and PwC suggested that the measures of output used in the definition of TFP must be the same as that used for pricing (i.e., billing) purposes.²⁴³ The implication is that, if an output measure is not priced, it should not be included in the definition of TFP. Economic Insights demonstrates, however, that this is only the case under assumptions of competitive market pricing and constant returns to scale. Where these assumptions do not hold, limiting coverage to billed outputs only may

²³⁹ AECT, supra n 214, p. 12; and Unison, supra n 41, p. 26.

²⁴⁰ Vector, 'Submission to the Commerce Commission on Productivity Measurement', 31 July 2009, p. 8.

²⁴¹ Economic Insights, supra n 189, pp. 61-62.

²⁴² *ibid.*, pp. 58-59.

²⁴³ PwC Powerco Report, supra n 233, p. 9.

introduce distortions in the analysis. This will particularly be the case if a single X-factor is to be applied across a diverse range of firms.²⁴⁴

- 6.71 Economic Insights provides a practical example of the problems that can arise from using only billable outputs and revenue weights to form an estimate of TFP growth that could be used in setting an X-factor. Economic Insights notes that, in Australia the electricity distribution businesses in Victoria place the majority of their charges on the variable components of throughput and, to a much lesser extent, peak demand. By contrast, in Queensland, electricity distribution businesses place nearly all their charges on fixed components (i.e., there are negligible throughput and peak demand charges). If billable outputs and revenue weights were used to form the TFP growth rate across these two Australian states then the resulting estimate would be appropriate for none of the electricity distribution businesses. If the alternative approach of using functional (or economic) outputs (of which billable outputs are a subset) and allowing for both costs and prices in forming output weights were used then all electricity distribution businesses would be put on an even footing. In Economic Insights' view, the resulting TFP estimate would be more appropriate for use in setting a common X factor across all the electricity distribution businesses.²⁴⁵
- 6.72 Moreover, Economic Insights considers PEG's preference for non-coincident network peak demand as one of three "billing determinant" outputs to be a poor proxy for the demands on which (large) consumers are charged. Each network's peak demand is a diversified value relating to the energy *entering* the distribution network, rather than the demands met (and charged for) at the consumer connection level. Furthermore, large consumers are not only billed in respect of their own peak demand (as opposed to network peak demand) but are often also billed on energy delivered (in kWh) and capacity (in kVA).
- 6.73 Economic Insights adds that non-coincident peak demand for the EDB industry has increased at twice the rate of transformer capacity over the period 1999-2008. Therefore, Economic Insights' estimate of EDB productivity (discussed below at paragraphs 6.96-6.113), which uses transformer kVA-km rather peak demand, is likely to be conservative in favour of the EDBs.²⁴⁶
- 6.74 Generally PEG challenged the Commission's proposal to use physical-based input quantities. PEG maintains that monetary measures of capital stocks should be used as measures of capital input quantities. In its view, physical measures of capital inputs will be inconsistent with ensuring capital cost recovery to set prices. In response, Economic Insights stresses that the primary data required for TFP studies are output and input quantities. Where financial measures are used, physical quantities must be derived by deflating

²⁴⁴ Economic Insights, *supra* n 189, pp. v and 57-61.

²⁴⁵ *ibid*, p. 59.

²⁴⁶ *ibid*, pp. 61-62.

the monetary values by a price index. This is an indirect way of deriving the required quantity measure. In Economic Insights' view, where appropriate data is available, a direct approach is to be preferred over an indirect approach.²⁴⁷

- 6.75 For the B-factor analysis, the Commission assumed that the service potential of physical assets materially deteriorates only at the end of their lifetimes. By contrast, using financial capital quantities implicitly means that physical assets are assumed to deteriorate at the same rate as the financial depreciation of those assets. PEG has claimed that a financial depreciation approach is a more well-established approach. Economic Insights notes, however, that the national statistical agencies of New Zealand, the US and Australia have all adopted depreciation assumptions for productive capital stocks that are closer to the physical deterioration profile that was employed by the Commission in deriving the B-factor profile, than to a financial depreciation profile.²⁴⁸

Use of Indexed Historic Cost-Based Asset Value Series

- 6.76 As noted in paragraph 6.63, the TFP analysis employed to set the B-factor used the annual ODV values that had been reported under information disclosure (up until 2003) in forming the annual user cost of capital. Because the TFP model used physical quantity measures to proxy the annual service potential (or capital input quantity) of overhead lines, underground cables and transformers, these ODV asset values only affected the relative weights applied to the capital and opex input quantities used in forming total inputs.
- 6.77 Since the Thresholds were set, all EDBs were required by the Commission to undertake new ODV valuations on a consistent basis, as at 31 March 2004 ("2004 ODVs"). As part of the Commission's October 2008 revised information disclosure requirements, EDBs were also required to roll forward these 2004 ODVs in each subsequent year for capital additions, depreciation and disposals, and to index the asset values annually by the CPI. In other words, the 2004 ODVs values became 'deemed' historic cost values in 2004, and have been subsequently rolled forward in the same way that a 'true' IHC series would have been.
- 6.78 In the Discussion Paper, the Commission's preliminary view was to use an IHC asset value series when determining the user cost of capital, with the 2004 ODVs as the deemed base IHC value. The Commission considered that doing so would improve TFP measurement by moving to a more consistent asset valuation method over the analysis period. The Commission emphasised, however, that the use of initial asset valuations in this context will only have a second-order effect on productivity, because they only affect the relative input weights in the analysis.

²⁴⁷ *ibid.*, p. 60.

²⁴⁸ *ibid.*, pp. 61-63.

Submissions on the Use of an IHC-Based Asset Value Series

- 6.79 Submissions were mixed in their views as to the use of IHC, or of alternatives such as un-indexed depreciated historic cost (“DHC”) or ODV. Eastland agreed with the Commission’s preliminary view that the 2004 ODVs would appear to be the best starting point given that they are the first valuations to contain accurate and appropriate treatment of underground cables as well as sufficiently detailed information to allow asset specific input shares to be used for productivity analysis. Eastland also supported the approach to continue the already existing indexed database from 2004 before choosing a new methodology such as IHC or DHC.²⁴⁹
- 6.80 Unison considered that if the Commission was to continue with its proposed approach then the asset base used for TFP needs to be consistent with the RAB for other regulatory purposes. Although Unison agreed that the 2004 ODV is the best starting point for an electricity distribution IHC series, Unison submitted that, in its case, there are a number of corrections that should be made to its 2004 ODVs (with an aggregate value for Unison of approximately \$89m).²⁵⁰ Unison considered that DHC is preferable to IHC—in respect of investment incentives—for updating the 2004 ODVs in subsequent years.²⁵¹
- 6.81 Orion stated that it was not persuaded by the Commission’s arguments in favour of moving forward with an IHC methodology and, like Unison, considered that if the Commission moved away from an ODV methodology then a DHC methodology should be used.²⁵²
- 6.82 Aurora noted that asset valuation has only a second-order impact on setting the X-factor for the DPP. Consequently, Aurora concluded that, for the Reset DPP, the choice of asset valuation method is unlikely to be significant for most EDBs.²⁵³
- 6.83 PwC inferred from the Discussion Paper that the Commission was proposing to ignore the revaluation gains associated with indexing the asset value series for inflation under an IHC approach, and that ignoring the revaluation gains would be incorrect. The Commission clarifies that it was only proposing to ignore the impact of the one-off revaluation gain associated with the 2004 ODVs, due to issues around the restatement of the value of underground cables (which had previously been valued as overhead lines).²⁵⁴ The Commission also stresses that Economic Insights’ analysis of EDB productivity (discussed below at paragraphs 6.96-6.113) forms the user cost

²⁴⁹ Eastland, *supra* n 55, p. 20.

²⁵⁰ Unison, *supra* n 41, pp. 25-26.

²⁵¹ *ibid*, p. 25.

²⁵² Orion, *supra* n 21, p. 33.

²⁵³ Aurora, *supra* n 19, p. 13.

²⁵⁴ Commerce Commission, *supra* n 16, p. 92.

of capital from the IHC series over the period 1996-2008 using a real WACC, and therefore no adjustments for revaluations due to CPI-indexation are required.²⁵⁵

The Commission's Current Views on Estimating the TFP Growth Rate

- 6.84 The Commission notes that, while in a broader sense the choice of asset valuation methodology for rolling forward the asset base is an important one for incentives, the choice of asset valuation series is not particularly material to the TFP analysis. The Commission continues to favour the use of an IHC series anchored on the 2004 ODV, as it provides a readily available source of consistent data.
- 6.85 The Commission is also not persuaded that a financial approach to specifying input quantities is to be preferred over the physical quantities approach. The financial approach provides an indirect rather than a direct way of arriving at a similar outcome, and assumes a deterioration profile that is likely to be less consistent with the actual manner in which the service potential of the majority of EDB assets deteriorate.
- 6.86 The Commission acknowledges Economic Insights' conclusion that including only billed outputs in the analysis may not be appropriate for industries like electricity distribution where there is neither constant returns to scale nor competitive market pricing (paragraphs 6.70-6.71). In particular, the Commission notes that the EDBs have significant freedom in terms of what type and mix of quantities (e.g., kVA, kWh, kW etc) they choose to price on, which is partly a reflection of the monopolistic character of the industry. Consequently, the Commission considers that specifying outputs based entirely on billed outputs in an industry-wide productivity analysis would be difficult.
- 6.87 The Commission recognises that any approach to defining and weighting inputs and outputs for EDBs will have some shortcomings. In particular, the Commission has acknowledged the shortcomings in the old line MVA-km measure, which is why it has considered alternatives. In the results reported below, Economic Insights uses line MVA-km or transformer kVA-km, whereas PEG uses system peak demand. These different measures provide the Commission with a range of approaches to consider and potentially take into account. While it is debatable whether other measures, such as consumer peak demand multiplied by line length, would provide a better representation of EDB outputs, the data necessary to implement such an approach is not readily available.

²⁵⁵ Economic Insights, supra n 189, p. 16.

6.5 Input Price Differential

Accounting for Input Price Differentials

- 6.88 When setting the rate of change, the Commission may take into account the effects of inflation on the inputs of suppliers of the relevant services.²⁵⁶ In applying the traditional TFP X-factor approach set out in Formula 4, the input price term for the industry has typically been taken as a weighted average of the movement in opex prices and the movement in the standard user cost of capital. Implementing the input price differential component of the traditional X-factor formula has, however, often proven problematic for regulators because of the erratic and unreliable movements in many input price indices—particularly in the capital goods input price indices used to form the user cost of capital measure.
- 6.89 This is because statistical agencies typically devote fewer resources to compiling industry-specific input price indices than to general economy-wide price indices (e.g., CPI) and the samples used tend to be relatively small. Resulting inaccuracies are compounded as past trends are then applied as a forecast of future input price differences. In setting the Thresholds for EDBs, the Commission decided to set the input price differential term in the B-factor to zero because of contradictory information from the relevant capital goods price indices.²⁵⁷
- 6.90 In the Discussion Paper, the Commission indicated that, apart from better reflecting sunk costs and FCM, a further advantage of applying the amended TFP X-factor formula in Formula 6 is that the input price differential does not need to be derived from potentially volatile external data such as the capital goods price index. Rather, it can be derived directly from the data which is already being gathered for use in other aspects of the full TFP formula, such as the TFP growth index.

Submissions on Accounting for the Input Price Differential

- 6.91 Reflecting that the Commission's proposals for refining the TFP methodology has a significant impact on the input price differential term, EDBs expressed a preference for further analysis and reiterated that the Commission should be cautious when implementing any new approach.
- 6.92 Vector was of the view that the consultation period was too short to assess the Commission's views on the input price differential, and requested that the Commission work with industry to develop a tool to measure key elements of input price inflation.²⁵⁸ AECT surmised that “[i]f the price of factor inputs of the distribution industry are increasing faster than input costs in the broader

²⁵⁶ supra n 5, section 53P(7).

²⁵⁷ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime, Threshold Decisions (Regulatory Period Beginning 2004)*, 1 April 2004, paragraph 240.

²⁵⁸ Vector, supra n 11, paragraphs 22-24.

economy, then the industry will have lower productivity improvements than the broader economy.”²⁵⁹

The Commission’s Current Views on Accounting for the Input Price Differential

- 6.93 For the same input and output specification, the way that the input price differential is derived is likely to be the most material difference between the amended TFP X-factor approach and the B-factor approach. The amended approach recognises that, in reality, changes in input prices do not impact the cost of assets that are sunk.
- 6.94 In this respect, the amended approach is conceptually more consistent with the characteristics of the EDB industry. It ensures that when industry-wide input prices are increasing faster than those in the wider economy, EDBs are not compensated for expenditure that they have never incurred. On the other hand, it also ensures that when industry-wide input prices are decreasing relative to the economy, EDBs are not penalised by being expected to cut costs in respect of investments that have already been made.
- 6.95 Furthermore, by deriving input prices from EDB data, rather than from external price indices, the amended approach is likely to use information more applicable to the regulated suppliers under consideration.

6.6 Analyses of EDB Productivity

Economic Insights’ Analysis of EDB Productivity (1996-2008)

- 6.96 As noted in paragraph 6.6, the Commission engaged Economic Insights to assess EDB productivity during the period 1996-2008, to inform the Commission’s draft decision on an appropriate X-factor. This section considers Economic Insights’ analysis and the implications of its results for the value of the X-factor.

Productivity Growth Differential for EDBs

- 6.97 Economic Insights undertook its analysis taking into account the proposed refinements to the TFP methodology discussed above, specifically the use of:
- the amended Formula 6 to reflect sunk costs and for consistency with FCM, to replace the B-factor formula used in setting the Thresholds (i.e., Formula 5);
 - transformer kVA-km system capacity output measure (paragraph 6.65), instead of the lines MVA-km measure that was used in deriving the B-factor (paragraph 6.62); and
 - capital amortisation costs based on an IHC asset value series with the 2004 ODVs as the base point (paragraph 6.78),²⁶⁰ instead of the 12.5% of ODV user cost proxy used in deriving the B-factor (paragraph 6.63).

²⁵⁹ AECT, supra n 214, p. 12; and Unison, supra n 41, p. 12.

²⁶⁰ The data required to roll forward the 2004 ODVs using IHC was sourced from the 2008 EDB information disclosure data (paragraph 6.77). For the present analysis, the data required to roll

- 6.98 In respect of the latter refinement, Economic Insights undertook its analysis using both a post-tax amortisation charge series and a pre-tax amortisation charge series (based on the corporate tax rate) to form the annual user cost of capital. A more appropriate series would be the pre-tax amortisation charge, based on the effective tax rate, because it is the most relevant for determining prices since taxes have to be paid out of gross revenue received. However, the effective tax rate for the industry is not available. Therefore, the pre-tax series (based on the corporate tax rate) and the post-tax series (which assumes an effective tax rate of zero) provide an upper and lower bound to an appropriate series.
- 6.99 Using the new formulation, including the refinements listed above, Economic Insights found that over the 13 year analysis period from 1996-2008 the industry TFP grew at a trend rate of between 1.04% and 1.14% per annum (using the pre-tax and post-tax amortisation charge series, respectively).²⁶¹
- 6.100 Economic Insights also undertook TFP analysis on EDBs more likely to be subject to the default/customised price-quality regulation using the new formula.²⁶² For the purpose of this analysis these EDBs are referred to as “indicative regulated EDBs”. These indicative regulated EDBs accounted for about 80% of consumer connections and energy delivered in 2008. Economic Insights found that the productivity performance of these EDBs has generally exceeded that of the distribution industry as a whole over the past 13 years, with the TFP growth rate between 1.40% and 1.53% per annum (using the pre-tax and post-tax amortisation charge series, respectively).²⁶³
- 6.101 Economic Insights notes that the Statistics New Zealand’s official multifactor productivity series for the market sector of the New Zealand economy shows a trend growth rate of 1.08% per annum for the 13 years 1996-2008. As shown in Table 3, this means that the productivity differential for the TFP formulation, including all the refinements, is between -0.05% and 0.06% (using the pre-tax and post-tax amortisation charge series).²⁶⁴ The

back the asset values before the 2004 ODVs on an IHC basis are not available. Therefore, for the period 1996-2003, an estimated IHC series has been formed using information derived from the earlier ODV series (Economic Insights, *supra* n 189, p. 17). Disaggregated asset value data for each capital component became available in the 2004 ODV, and has been used by Economic Insights in determining the weights given to the three capital components. This disaggregated information was not available when the B-factor was set (footnote 236).

²⁶¹ Economic Insights, *supra* n 189, pp. 27-28.

²⁶² Economic Insights excluded 12 EDBs from this scenario, based on a preliminary appraisal of the EDBs against the criteria that define ‘consumer-owned’ EDBs (*supra* n 189, pp. 14-15). The Commission highlights that this selection is intended to be indicative only and does not reflect the Commission’s views on which EDBs satisfy the criteria for exemption under section 54D of Part 4. For further detail on exemptions under a DPP, refer *supra* n. 1.

²⁶³ Economic Insights, *supra* n 189, pp. 29-30.

²⁶⁴ *ibid*, p. 29.

corresponding TFP growth differential for the subset of indicative regulated EDBs is between 0.32% and 0.45%.

Table 3 Economic Insights' EDB Productivity Growth Differentials

	Industry TFP Growth	Economy TFP Growth	TFP Growth Differential
All EDBs (pre-tax)	1.04%	1.08%	-0.05%
All EDBs (post-tax)	1.14%	1.08%	0.06%
Indicative regulated EDBs (pre-tax)	1.40%	1.08%	0.32%
Indicative regulated EDBs (post-tax)	1.53%	1.08%	0.45%

Impact of the Refinements to the TFP Methodology on the TFP Growth Differential

- 6.102 Economic Insights undertook a number of sensitivity analyses to demonstrate the impact of the refinements to the TFP methodology.
- 6.103 First, Economic Insights calculated the industry TFP using the amended Formula 6, but with the old line MVA-km output measure. The corresponding industry TFP growth rate was between 0.36% and 0.46% (for the pre-tax and post-tax amortisation charge series, respectively).²⁶⁵
- 6.104 Economic Insights also calculated the industry TFP using the old B-factor formula (i.e., with the 12.5% user cost proxy). Under this scenario the industry TFP was 1.04% per annum using the transformer kVA-km output measure, and 0.31% per annum using the old line MVA-km output measure.²⁶⁶

Recommendations on the Productivity Growth Differential

- 6.105 Economic Insights considers that, in light of its analysis and the available information, a conservative course of action would be to set the productivity growth differential term to zero. However, Economic Insights notes that if only that part of the industry that is likely to be subject to the DPP is considered, the TFP growth differential term suggested by the analysis is a positive value of around 0.4%.²⁶⁷

Input Price Differential (including the Impact of Refinements)

- 6.106 Under the amended TFP X-factor formula in Formula 6 above, the capital component of the input price trend growth for the industry is derived from the amortisation charge series used in calculating TFP growth. Using this

²⁶⁵ *ibid*, p. 30.

²⁶⁶ *ibid*.

²⁶⁷ *ibid* p. 39-40.

approach, Economic Insights found that industry input prices have increased by between 1.74% and 1.91% per annum over the 13 year analysis period (for the pre-tax and post-tax amortisation charge series, respectively). Given that the economy-wide input price trend growth over the same period is 2.06% per annum, this suggests an input price differential of between -0.16% and -0.32%.²⁶⁸

- 6.107 As noted above (paragraph 6.33), in deriving the B-factor for the Thresholds, the Commission set the input price differential between the distribution industry and the economy to zero, given the conflicting information from various official capital goods price indices, particularly those for power lines and transmission lines. Economic Insights notes that conflicting information, including volatility, is similarly apparent in these indices for recent years.²⁶⁹
- 6.108 Using the simple user-cost based approach that had been used in informing the input price differential term for the B-factor, Economic Insights found that the industry input price trend is 2.3% per annum. This analysis is based on the electrical works capital goods price index, and the labour cost index for the electricity, gas and water sector. Given that the economy-wide input price trend growth is 2.06% per annum, this approach would suggest an input price differential of 0.24%.²⁷⁰
- 6.109 Given the two stage process used to form the asset value series (see footnote 260), Economic Insights also assessed the input price differential for a shorter period of 2004-2008 (i.e., ignoring the earlier asset value series from 1996-2003). Over this shorter period, the input price differentials, assessed using both approaches, are comparatively higher (i.e., between 0.25% and 0.30%).²⁷¹

Recommendations on the Input Price Differential and Overall X-factor

- 6.110 Economic Insights notes, however, that the recent global economic slowdown means that both the industry and market sector input price growth rates are likely to be lower going forward. The 'bubble' in commodity prices is likely to have contributed to the higher growth rate in capital input prices in recent years (in particular 2004-2008). However, the recent economic slowdown is likely to have substantially lessened and/or reversed commodity price growth rates. Economic Insights is therefore of the view that the longer 1996-2008 period is the appropriate period over which to calculate the input price growth differential to apply during the Reset DPP.²⁷²

²⁶⁸ *ibid.*, p. 40.

²⁶⁹ *ibid.*, p. 34.

²⁷⁰ *ibid.*, p. 40.

²⁷¹ *ibid.*

²⁷² *ibid.*, p. 41.

- 6.111 Economic Insights also highlights that the input price trend growth rates derived using the amortisation charge series are based on actual EDB capital expenditure over the relevant period. By contrast, the user cost-based input price trend is based on the replacement price of all assets, including sunk assets. Consequently, application of the user cost-base approach to derive the input price differential term in the X-factor would compensate EDBs for capital expenditure that they have never incurred. As a result, Economic Insights recommends the use of an input price differential derived using the amortisation charge approach.
- 6.112 Given that the input price differential term is subtracted from the TFP growth differential term, the negative input price differential—using the amortisation charge approach—would increase the X-factor. Economic Insights notes, however, that a conservative course of action in favour of the EDBs would be to set the input price differential term to zero, given its relatively small magnitude over the analysis period.²⁷³
- 6.113 Economic Insights’ recommended results, as derived and within the range formed by the pre-tax and post-tax amortisation charge series, are shown in Table 4 below. As Economic Insights recommends setting both the TFP growth differential term and the input price differential term to zero, its analysis, in aggregate, implies that the X-factor be set to zero.²⁷⁴

Table 4 Summary of Economic Insights’ Recommendations

	Derived Pre-tax	Derived Post-tax	Recommended
TFP Growth Differential	-0.05%	0.06%	0%
Input Price Differential	-0.32%	-0.16%	0%
X-Factor	0.27%	0.21%	0%

Pacific Economics Group’s Analysis of EDB Productivity (1999-2008)

- 6.114 As noted above, ENA commissioned PEG to conduct a TFP study of New Zealand EDB productivity performance.²⁷⁵ Both PwC and Unison explicitly urged the Commission to consider PEG’s analysis and findings.²⁷⁶
- 6.115 In its report, PEG explained that its work had two complementary goals. The first was to “set objective bounds on a reasonable range for the X factor, where the bounds were based directly on the results of rigorous empirical research.” The second was to assess “the impact of recent industry and broader economic trends which should inform the Commission’s thinking

²⁷³ *ibid.*

²⁷⁴ *ibid.*, p. 42.

²⁷⁵ PEG, *supra* n 190.

²⁷⁶ PwC, *supra* n 53, paragraph 5; and Unison, *supra* n 41, pp. 24-25.

and appropriate exercise of regulatory discretion in choosing a particular X factor from within the X factor range.²⁷⁷

- 6.116 The three output quantities used by PEG were: the number of customers, total energy delivery volumes (GWh), and non-coincident demands (GW). PEG's input quantity index was constructed as a weighted average of input quantity sub-indices for capital inputs and operation and maintenance expenses.²⁷⁸
- 6.117 Eight specific options for an X-factor for the Reset DPP are presented by PEG in its paper.²⁷⁹ The Commission notes that PEG subjected its quantitative analysis to a qualitative plausibility assessment, in order to inform its recommendations on a reasonable X-factor range. PEG concluded that, of the eight options presented in its paper, three options were acceptable for use as the X-factor under the DPP, as it considered the other options to provide implausible results. Table 5 below presents PEG's eight options, with its implausible options denoted by the shaded rows.

Table 5 PEG's X-Factor Options²⁸⁰

Option	TFP Industry	TFP Economy	TFP Differential	Input Price Differential	X-Factor
1	1.21%	1.09%	0.12%	0.07%	0.19%
2*	1.21%	0.55%	0.66%	-0.46%	0.20%
3*	-0.08%	1.09%	-1.17%	1.75%	0.58%
4**	-0.08%	0.55%	-0.63%	1.22%	0.59%
5	1.21%	1.09%	0.12%	0%	0.12%
6*	1.21%	0.55%	0.66%	0%	0.66%
7*	-0.08%	1.09%	-1.17%	0%	-1.17%
8	-0.08%	0.55%	-0.63%	0%	-0.63%

* Implausible industry TFP and economy TFP combination

** Implausible input price differential

- 6.118 PEG's two alternative industry TFP growth results arise from the use of two different analysis periods. The higher TFP growth rate of 1.21% per annum relates to a 1999-2008 period, whereas the lower TFP growth rate of -0.08% per annum relates to a shorter period of 2001-2008.
- 6.119 Like Economic Insights, most of the options presented by PEG use Statistics New Zealand's official multi-factor productivity series for the market sector of the economy, which shows a trend growth rate of about 1.1%. PEG noted that this value is essentially the same as that used in setting the B-factor for the Thresholds.

²⁷⁷ PEG, supra n 190, p. 2.

²⁷⁸ *ibid.*, pp. 11-16.

²⁷⁹ *ibid.*, p. 33.

²⁸⁰ *ibid.*, p. 37.

- 6.120 PEG, however, also suggested that an alternative approach for assessing economy-wide productivity would be to analyse the multi-factor productivity series from the peak of one business cycle to the peak of another. PEG stated that the latest peak-to-peak TFP trend for the economy is likely to be for the period 2000-2008, over which New Zealand's multi-factor productivity grew on average by only 0.55%. PEG concluded that the most recent information may therefore imply that the long-run productivity trend for the New Zealand economy is only about half the value used to calculate the previous B-factor.²⁸¹
- 6.121 All of PEG's "plausible" options involve an input price differential of close to zero, or zero. In fact, PEG stated that "we do believe that a reasonable value for the input price differential is zero. This is equivalent to the value that was approved in the previous Thresholds."²⁸²
- 6.122 Overall, PEG's plausible options provide a range for the X-factor consisting of an upper bound of 0.19% and a lower bound of -0.63%. PEG is of the view that, since 2005, industry inputs have been growing more rapidly than outputs, because output growth has generally slowed while the pace of capital investment has accelerated. Consequently, PEG concluded that, if these trends are expected to continue, it is appropriate for the X-factor to be set towards the lower end of its recommended range.²⁸³

International Productivity Data

- 6.123 The Act provides for the potential use of international data when setting the X-factor.²⁸⁴ As noted above (paragraph 6.20), the Commission expressed a preliminary view in the Discussion Paper that it may be appropriate to use international data to help assess whether the findings of its productivity analysis are reasonable. However, it stated that international data should not be directly incorporated into the productivity analysis used to inform setting of the X-factor. The Commission undertook to seek potential sources of data that would provide a useful 'sanity-check' of the Commission's productivity analysis (paragraph 6.20-6.22).
- 6.124 The Commission requested that Economic Insights' Productivity Report include a high-level comparison of international TFP growth rates with those derived for New Zealand EDBs. The report presents comparable results for electricity distributors in Victoria, Australia, and for investor-owned EDBs in the US.²⁸⁵

²⁸¹ *ibid*, pp. 4-5.

²⁸² *ibid*, p. 32.

²⁸³ *ibid*, p. 36.

²⁸⁴ *supra* n 5, section 53P(6).

²⁸⁵ Economic Insights, *supra* n 189, pp. 32-33.

- 6.125 Economic Insights' assessment of the TFP growth rate for Victorian distributors over the period 1996-2007 is 1.2% per annum (using the transformer kVA-km output measure), or 0.5% per annum (using the line MVA-km output measure). Both results are close to the equivalent Economic Insights results for New Zealand (reported in paragraphs 6.99 and 6.103 respectively).²⁸⁶
- 6.126 Economic Insights also reports that PEG has undertaken an analysis of the same Victorian distributors, using a similar specification to PEG's analysis of New Zealand EDBs. The Victorian TFP index using PEG's specification shows a trend growth of 1.5% per annum. In addition, PEG has presented a TFP index for investor-owned EDBs in the US which shows a trend growth of 1.0% per annum for the period 1996-2006.²⁸⁷

The Commission's Current View on EDB Long-Run Productivity

- 6.127 The Commission notes that, despite using quite different approaches, Economic Insights' and PEG's findings on the long-run average productivity improvement rate achieved by EDBs are not substantially dissimilar.²⁸⁸ Overall, their recommendations for the X-factor largely fall within a similar range—i.e., between plus or minus one percent.
- 6.128 On industry TFP trend growth, PEG's lowest result is for the comparatively short period from 2001 onward. Also, PEG's overall recommendation, which is to choose an X-factor from the lower end of the range, is to a significant extent based on trends evident since 2005. The Commission considers, however, that given the reference in section 53P(6) to the *long-run* average productivity improvement rate, it is appropriate to place greater weight on results that cover a longer period. The industry TFP result for PEG's longest analysis period of 1999-2008 is about 1.2% per annum, whereas Economic Insights estimates the TFP growth from 1996-2008 to be between 1% and 1.1% per annum.
- 6.129 Given the availability of sufficient New Zealand data to undertake a TFP analysis, the Commission considers it is not necessary to place any direct weight on the international productivity data. Nevertheless, the Commission considers that it is reassuring that the overseas results examined are of the same order as the results for New Zealand.

²⁸⁶ *ibid.*, p. 33.

²⁸⁷ *ibid.*

²⁸⁸ The Commission notes that while the results of the two studies are similar in this instance, it is likely they would produce different results in other circumstances. This is because Economic Insights recognises the increasing returns to scale and sunk costs nature of the electricity distribution industry, whereas PEG assumes the industry has the characteristics of a competitive industry. The Commission considers that, all other things being equal, recognising the true characteristics of the industry is to be preferred.

- 6.130 Both Economic Insights and PEG consider New Zealand's economy-wide TFP growth to have been about 1.1% per annum. Combined with the industry-wide TFP growth estimates for New Zealand EDBs, this suggests an industry productivity growth differential of around zero percent per annum. Moreover, despite using a number of different approaches to estimating the input price differential, Economic Insights and PEG both consider that it would not be unreasonable to set the input price differential to zero.
- 6.131 The Commission notes that Economic Insights' industry-wide TFP results are not particularly sensitive to the use of the amended TFP X-factor formula instead of the former B-factor formula,²⁸⁹ or to the tax assumptions in the user cost of capital series. Of the refinements made to the methodology, the choice of output specification (i.e., transformer kVA-km versus line MVA-km) has the greatest effect on the results for the productivity growth differential.
- 6.132 On the one hand, results using line MVA-km suggest a lower X-factor than those where transformer kVA-km has been used, whereas other scenarios suggest a higher X-factor. For instance, PEG, considers 0.55% per annum to be an alternative and plausible value for economy-wide TFP growth. This might imply a larger industry productivity growth differential, and therefore a higher X-factor.²⁹⁰ In addition, Economic Insights' productivity analysis for the indicative subset of EDBs suggests a higher X-factor. Arguably, the EDBs likely to be subject to default/customised price-quality regulation are the ones that supply the services most relevant (under section 53P(6)) for determining the long-run average productivity improvement rate.
- 6.133 The Commission considers that, based on the available analysis and evidence, it is not unreasonable to conclude that the long-run productivity improvement rate achieved by EDBs relative to the economy (i.e., the TFP growth differential) has been around 0% per annum on average. Similarly, there is little evidence to suggest that the input price differential has been materially different from 0% per annum.

6.7 Draft Decision on the Rate of Change

- 6.134 As noted above (paragraph 6.28), the Commission considers that its choice of the X-factor is one of regulatory discretion. That choice should be made in light of the Part 4 Purpose and informed by appropriate analysis of relevant long-run average productivity improvement rates.

²⁸⁹ One contributing factor to this outcome is because the simple proxy of 12.5% of ODV provides a similar user cost of capital series to that derived using the pre-tax amortisation charge (Economic Insights, supra n 189, p. 27-28).

²⁹⁰ However, PEG suggests that if the economy is sluggish going forward, then this would, in turn, likely detrimentally impact the performance of the EDB industry. (Refer: PEG, supra n 190, p. 35).

- 6.135 The Commission emphasises that its decision on the X-factor affects *future* prices and incentives. By contrast, all the analytical results cover a *past* analysis period. Among other things, that analysis period has included:
- sector reforms;
 - changes in the way EDB data has been disclosed;
 - merger and acquisition activity;
 - significant increases in expenditure in recent years by some EDBs (which may reflect a ‘catch-up’ from past years);
 - a commodity price bubble; and
 - most recently, a major contraction of economic activity.
- 6.136 In addition, as noted above (paragraphs 6.26-6.27), the common X-factor is the least business-specific element of a DPP. The Commission does not consider it appropriate to set a common X-factor to address concerns that are better reflected through the more business-specific aspects of the DPP, such as starting price adjustments or quality standards, or that can be more appropriately dealt with as part of a CPP.
- 6.137 The Commission’s current view is that it is not unreasonable to conclude that both the productivity growth differential for EDBs and the corresponding input price growth differential have been zero percent per annum, on average. If such an outcome were translated into an X-factor impacting future prices, it would mean that, following any starting price adjustment to reflect current and future profitability, EDBs would need to hold their average prices constant in real terms under the Reset DPP.
- 6.138 The Commission’s draft decision is to set the rate of change under the Reset DPP (i.e., the X-factor) to be 0% per annum. As the X-factor reflects the difference between industry-wide and economy-wide productivity, a zero X-factor does not imply a lack of expected productivity improvements. Rather, for an input price differential of zero, an X-factor of zero means that the EDBs are expected to improve their productivity performance by at least the same rate as the economy as a whole. The Commission considers that, once appropriate starting price adjustments are made, it is not unreasonable for EDBs to keep their prices constant in real terms over the Reset DPP period. Exceptions will, however, occur in those circumstances where a CPP is warranted.
- 6.139 Setting the DPP in this manner recognises that EDBs will face inflationary and other cost pressures in respect of their incremental capital and operating expenditures during the coming regulatory period. It also implies that EDBs are not expected to improve productivity at a greater rate than the rest of the economy, during a period of potentially reduced future growth. Nonetheless, the price-path will still place incentives on EDBs to improve their efficiencies in real terms over that period, consistent with section 52A(1)(a) and (b). This is because EDBs will get to keep the benefits of efficiencies greater than those implied by their price path until their price-path is reset. Moreover, given that a price path acts to limit the level of revenue that an EDB can earn, the price-path will also limit excessive profits, consistent with section 52A(1)(d).

CHAPTER 7: QUALITY STANDARDS

7.1 This chapter sets out the Commission’s draft decisions on the quality standards that will apply to EDBs under the Reset DPP.

7.1 Introduction

7.2 The Act provides that every price-quality path must specify the quality standards to be met by a regulated supplier.²⁹¹ Under a DPP, quality standards may be prescribed in any way the Commission considers appropriate.²⁹² This chapter sets out the Commission’s draft decisions on the quality standards that will apply to EDBs under the Reset DPP. The chapter is divided into the following sections:

- *Overall Approach to Setting Quality Standards*: the framework and context for setting quality standards under the Reset DPP;
- *Quality Standards under the Reset DPP*: the indicators for assessing quality performance and the dataset to be used;
- *Accounting for Extreme Variation*: consideration of extreme events including the identification of major event days and the substitution of appropriate values into the datasets;
- *Accounting for Normal Variability*: consideration of statistical variability in the dataset and the use of dead-bands; and
- *Assessment of Compliance*: assessment process used to determine whether EDBs have complied with the quality standards.

7.2 Overall Approach to Setting Quality Standards

7.3 Section 52A(1)(b) refers to the promotion of incentives for EDBs to provide services at a quality that reflects consumer demands. The Discussion Paper noted the challenges that exist when attempting to accurately reflect consumer demands when setting quality standards under a DPP. These challenges include identifying consumers’ willingness to make a trade-off between the price and quality of electricity distribution services, and the lack of readily available information on consumer demands.

7.4 The requirement in the Act that default/customised price-quality regulation addresses the level of service quality is consistent with regulatory approaches used overseas in which regulators ensure that any reductions in expenditure that distributors achieve over the period are not achieved to the detriment of the standards of service that they provide.²⁹³ The Commission considers that

²⁹¹ supra n 5, section 53M(1)(b).

²⁹² ibid, section 53M(3).

²⁹³ Ofgem, *2007/08 Electricity Distribution Quality of Service Report*, p. 1; and Essential Services Commission (“ESC”), *Victoria, Final Decision, Electricity Distribution Price Review 2006-10, Final Decision Volume 1, Statement of Purpose and Reasons*, p. 23.

the setting of quality standards under the Reset DPP can be usefully informed by the treatment of reliability under the Thresholds. The Thresholds used a standard that was based on average historic performance, and was designed to ensure that no material deterioration in EDB reliability occurred. A review of industry performance against the quality threshold for the period 2003-2008 showed that a small-scale aggregate improvement in reliability occurred.²⁹⁴ This implies that compliance with a standard seeking to maintain historic performance can achieve an outcome of no material deterioration in performance and potentially a gradual improvement (as observed during 2003-2008).

- 7.5 In the Discussion Paper, the Commission's preliminary view was that it remained appropriate to set quality standards that sought to ensure an outcome of no material deterioration in EDB service quality during the regulatory period. The Discussion Paper defined material deterioration as "serious or significant" in which "short term variations ... caused by external factors out of the control of EDBs do not necessarily constitute material deteriorations in quality" and one where deterioration is "considered over a reasonable timescale".²⁹⁵
- 7.6 During the Thresholds, many reliability breaches occurred as a result of events and circumstances that were subsequently found to be beyond the direct control of EDBs. A key objective of the Part 4 regulatory regime is to provide greater certainty for EDBs, and the Commission has sought to mitigate the occurrence of such breaches when specifying quality standards under the Reset DPP. In particular, the Commission proposed that the following three mechanisms be incorporated into the quality standards:
- *Normalisation*: to account for extreme variation;
 - *Dead-bands*: to account for normal statistical variability in the data; and
 - *Multi-year Assessments*: to reflect performance over time and to further account for data variability.

Submissions on the Approach to Quality Standards

- 7.7 The Commission's proposal to implement quality standards that promote an outcome of no material deterioration was supported by the majority of submissions.²⁹⁶ PwC, for example, commented that "the standard of no

²⁹⁴ Parsons Brinckerhoff Associates (PBA), *Resetting the 2009 Quality Thresholds: Investigation Report, Prepared for Commerce Commission*, 19 December 2007, p.30.

²⁹⁵ Commerce Commission, supra n 16, p. 108.

²⁹⁶ PwC, supra n 53, paragraph 5(xviii); Vector, supra n 11, paragraph 3(d); Powerco, supra n 15, paragraph 23; Orion, supra n 21, p. 38; and ENA, supra n 18, p.15.

material deterioration in quality is an appropriate standard on which to base the quality path, and is consistent with the price path specification.”²⁹⁷

- 7.8 In its submission to the Discussion Paper, MEUG considered that the Reset DPP should differentiate performance targets by customer class. MEUG commented that “different classes of consumers have very different quality expectations”.²⁹⁸ While acknowledging that this is the case, the Commission considers that a separate performance target for different consumer groups is not a feasible option under the Reset DPP. This is primarily due to the absence of readily available information to set and assess customised targets, particularly in relation to the respective value placed by those groups on the value of service quality. As discussed above, differentiated performance targets may prove more appropriate under an S-factor mechanism (discussed in paragraphs 3.59-3.63) or under a CPP.
- 7.9 Submissions to the Process Paper agreed with the Commission’s intention to mitigate the occurrence of breaches that are deemed to be reasonably beyond the control of EDBs.²⁹⁹ PwC commented that they “are pleased that the Commission has acknowledged our concerns about the implications of potential technical breaches, given the more significant penalties which will apply if DPP paths are breached and are encouraged that the Commission has chosen the benchmark of ‘no material reduction in quality’”.³⁰⁰ Vector also agreed with the Commission’s intention to minimise the occurrence of such breaches.³⁰¹
- 7.10 In addition to the matters highlighted in the Discussion Paper, some submissions pointed to a need for the implementation of the quality standards to be based on a robust statistical framework. ENA commissioned Statistics Research Associates Limited (“SRA”) to assess the Commission’s proposals and make recommendations based on the statistical properties of EDBs’ reliability data. This work was presented as a submission to the Discussion Paper and is referred to in this paper as the “SRA Report”.³⁰² The Commission has considered the SRA Report and its recommendations when making the draft decisions set out in this chapter.

²⁹⁷ PwC, supra n 53, paragraph 5(xviii).

²⁹⁸ MEUG, supra n 55, paragraph 5.

²⁹⁹ Eastland, supra n 96, p. 8; ENA, supra n 93, p.11; Orion, supra n 36, p. 6; Powerco, supra n 36, p. 4; PwC, supra n 94, p. 8; Vector, supra n 166, p. 7; and Wellington Electricity, supra n 112, p. 3.

³⁰⁰ PwC, supra n 53, p. 8.

³⁰¹ Vector, supra n 11, paragraph 142.

³⁰² Statistics Research Associates Limited, *Comments on Chapter 8 of the Commerce Commission Discussion Paper, Reset of Default Price-Quality Path for Electricity Distribution Businesses (19 June 2009)*, 17 July 2009 and revised 30 July 2009.

Current Views on the Approach to Quality Standards

- 7.11 The Commission has sought to develop simple, cost-effective and transparent quality standards which can be consistently applied to all EDBs under the Reset DPP. By mitigating, to the extent practicable, breaches that are deemed to be reasonably beyond the control of an EDB, the quality standards will contribute to the promotion of regulatory certainty. The incorporation of statistical considerations into the process reflects the views of submissions and will further promote certainty. The Commission has sought to develop quality standards to apply under the Reset DPP that will promote an outcome of no material deterioration in EDBs' service quality.
- 7.12 The Commission considers that, particularly in the time available, it would be inappropriate to target quality levels to individual classes of consumer under the Reset DPP. Targeting specific quality levels would be resource intensive for both the Commission and EDBs, and this may not be consistent with the *Cost-Effectiveness Principle*. The Commission acknowledges that some consumers may be prepared to pay a higher price for a higher quality of distribution service and some would accept a lower quality of service if the price was reduced by a satisfactory amount. However, in many cases EDBs may be restricted from identifying such requirements providing differentiated service levels, for example to customers on a shared connection. Generally, quality levels are not targeted to individual consumers³⁰³ and an aggregate approach is used. The Commission considers that a no material deterioration approach is likely to provide a reasonable reflection of aggregate consumer demands and so be consistent with section 52A(1)(b). The use of historic performance levels to define the minimum level of quality that a network should achieve during the regulatory period is also consistent with the approach to quality adopted under the Initial DPP.
- 7.13 Despite the aggregate nature of the proposed quality standards, the Commission considers that EDBs should not lose sight of the need to address, where practicable, the demands of individuals, groups or classes of consumers. The Commission does not consider it appropriate to introduce disincentives to the tailoring of service quality, where this is undertaken with the agreement of affected consumers. The Commission considers that the presence of such arrangements³⁰⁴ could potentially be taken into account when assessing the need for action following a breach. This issue may be addressed under a process to develop Enforcement Guidelines (see paragraph 1.8). The Commission also notes that a CPP, or a potential S-factor mechanism may be better able to address differentiated levels of service quality.

³⁰³ Exceptions to this will include larger industrial customers and those whose preferences and connections can be readily isolated (e.g., irrigation schemes).

³⁰⁴ For example, if a distinguishable group of customers were willing to accept a higher potential for interruption in exchange for lower charges.

- 7.14 The proposed quality standards include measures to take account of variability that contributed to the large number of breaches under the Thresholds, including extreme events (see paragraph 7.52) and normal variability, e.g., minor third-party damage (see paragraph 7.67).

7.3 Quality Standards under the Reset DPP

- 7.15 This section discusses the form of quality measures, and the choice of reference period and corresponding data to be used under the Reset DPP.

A Definition of Quality

- 7.16 The Act provides the Commission with considerable flexibility to set quality standards. These may be prescribed in any way the Commission considers appropriate.³⁰⁵ Various facets of quality could be considered, including responsiveness to consumers and reliability of supply measures such as continuity of supply, voltage stability, waveform and frequency. In the Discussion Paper, the Commission proposed that the basis of the Reset DPP quality standards be reliability of supply, specifically continuity of supply as quantified by SAIDI and SAIFI outage indices.³⁰⁶

Submissions on the Definition of Quality

- 7.17 Submissions to the Process and Discussion Papers agreed with the Commission's view that reliability provides a suitable representation of quality for the purposes of regulation under a DPP.³⁰⁷ Vector stated that it "agrees with the Commission that reliability of supply should be the focus of the quality standards for the next regulatory period. Reliability is the 'component' of quality of service that is generally most important to our customers."³⁰⁸ Many of these submissions also voiced their support for the use of SAIDI and SAIFI indices to assess reliability performance, while no submissions opposed the use of these indices.³⁰⁹ Powerco commented that it supported the "focus on reliability as an indicator of quality", stating that "the use of SAIDI and SAIFI indices to measure quality is appropriate, as these are internationally accepted measures of reliability".³¹⁰

³⁰⁵ supra n 5, section 53M(3).

³⁰⁶ Commerce Commission, supra n 16, p. 112 and supra n 161, p. 9.

³⁰⁷ Eastland, supra n 55, p. 24; Orion, supra n 21, paragraph 43; Powerco, supra n 15, paragraph 55; PwC, supra n 94, p. 8; Vector, supra n 166, p. 7 and supra n 11, paragraph 137; and Wellington Electricity, supra n 112, p. 3.

³⁰⁸ Vector, supra n 166, p. 7.

³⁰⁹ Orion, supra n 21, paragraph 43; Eastland, supra n 55, page 24; and Vector, supra n 11, paragraph 137

³¹⁰ Powerco, supra n 15, paragraph 55

Current views on the Definition of Quality

- 7.18 The Commission retains its view that supply reliability should form the basis of quality standards under the Reset DPP. Supply reliability may comprise a number of dimensions, many of which (e.g., waveform shape, frequency and voltage stability) are driven largely by generator performance and are, to a large extent, outside the control of EDBs. The Commission's current view is that supply reliability, specifically continuity of supply, should provide the basis for determining EDB service quality.
- 7.19 The Commission's current view is that reliability should be measured using two internationally accepted³¹¹ continuity of supply indices, SAIDI (interruption duration) and SAIFI (interruption frequency).³¹² SAIDI and SAIFI have been used to regulate EDB quality in the past, as such EDBs already have data collection systems in place to derive these indices and a series of historic performance data is available for each network. It has also been proposed that the SAIDI and SAIFI indices continue to be included under information disclosure.³¹³ Furthermore, SAIDI and SAIFI indices are readily quantifiable and so provide a reasonably definitive and objective assessment of reliability performance.
- 7.20 An issue that was not explicitly addressed in the Discussion Paper nor raised by submissions is the assessment of reliability across networks that, while being essentially geographically and electrically independent, are controlled by a single EDB. The Commission considers that the reliability of such "non-contiguous networks" should be considered separately, to reflect likely topographical differences and possible climate differences between them and the likelihood that events that occur in one network area will have little or no impact on the other network's performance. Examples of EDBs with networks that are sufficiently distinct to be considered non-contiguous are Aurora (Dunedin and Central Otago networks) and Powerco (eastern and western region networks).³¹⁴ Aurora's Dunedin urban network is, for example, unlikely to have similar reliability indicators as the company's predominantly rural Central Otago network. Quality assessment based on a

³¹¹ The SAIDI and SAIFI indices are widely used by overseas regulators to quantify reliability, e.g., Australia, refer Essential Services Commission, *Electricity Distribution Price Review 2006-10, Final Decision Volume 1, Statement of Purpose and Reasons*, p. 33.

³¹² System Average Interruption Duration Index (SAIDI) is calculated as the average outage duration for each customer measured in units of time, usually minutes per year. System Average Interruption Frequency Index (SAIFI) is calculated as the average number of interruptions that a customer would experience over a year.

³¹³ Commerce Commission, *Information Disclosure Discussion Paper*, 29 July 2009, p. 127.

³¹⁴ Powerco's western region covers Taranaki, Wanganui, Rangitikei, Manawatu, Tararua and Wairarapa. Powerco's eastern region covers Tauranga, Thames, Coromandel, Eastern and Southern Waikato.

combined network would mask the respective performance levels and prevent an accurate assessment of either network.³¹⁵

- 7.21 The Commission has previously considered the treatment of non-contiguous networks under the Thresholds reset process, on which it received a number of submissions.³¹⁶ The majority of these submissions supported the proposal to apply separate thresholds for non-contiguous networks. Unison supported the separate treatment of non-contiguous networks where they have fundamentally different characteristics.³¹⁷ Vector considered that reporting separately on different networks was reasonable.³¹⁸

Draft Decision on Definition of Quality

- 7.22 The Commission's draft decision is that the quality standards will be based on annual reliability performance as determined from measured SAIDI and SAIFI values for each EDB. EDBs with non-contiguous networks are to derive separate SAIDI and SAIFI datasets for each network.

Reference Data

- 7.23 In the Discussion Paper, the Commission suggested that historic reliability, for a fixed period (e.g., 1 April 2004 to 31 March 2009) or alternatively for a rolling five-year period, be used as the basis for setting reliability targets. The Commission's preliminary view was that five-year historic average SAIDI and SAIFI data was likely to better reflect an EDB's underlying reliability than data from a single year. The Commission also noted that daily outage data for the 2008/09 regulatory year may need to be obtained from EDBs.

Submissions on Reference Data

- 7.24 No submissions disagreed with the use of a fixed five-year dataset period, while a number of submissions explicitly supported it.³¹⁹ Orion noted that a five-year period would be consistent with the Thresholds. PwC and Orion did not support the use of a five-year rolling period, with Orion expressing concern that a rolling period would not be appropriate due to a potential overlap between the standard and the years used to assess compliance. PwC and Vector supported the use of the 1 April 2004 to 31 March 2009 period. PwC noted that the use of a fixed five-year period will reflect data that has been externally reviewed under the existing threshold regime. The

³¹⁵ The Commission issued a preliminary view in the *Information Disclosure Discussion Paper* that separate disclosure of quality and statistics should be made for each non-contiguous network controlled by an EDB. Refer Commerce Commission, supra 313, p. 129.

³¹⁶ Specifically, the proposal was that separate quality thresholds be applied to non-contiguous networks. Refer Commerce Commission, supra n 154, pp. 65-66.

³¹⁷ Unison, Letter to Commerce Commission, 18 February 2008, pp. 6-7.

³¹⁸ Vector, Electricity Thresholds Reset, Response to Discussion Paper, p. 28.

³¹⁹ Orion, supra n 21, p. 2; Unison, supra n 41, p. 2; Eastland, supra n 55, p. 8; PwC, supra n 53, p. 9; and Vector, supra n 11, p. 27.

Commission notes that EDBs did not suggest that it was necessary for the Commission to request 2008/09 daily outage data, while Eastland proposed that “the Commission uses the data it already has available”.³²⁰

Current Views on Reference Data

- 7.25 The Commission’s current view is that a dataset of daily SAIDI and SAIFI outage data for the Reference Period 1 April 2004 to 31 March 2009 (“Reference Dataset”) be assembled for each network (including non-contiguous networks). This data is to be used by EDBs in assessing their quality performance. The Commission considers that five years of data will reflect an EDB’s underlying reliability performance and will support the proposed approach to quality standards. This data will also support the Commission’s proposed use of normalisation to account for extreme events (discussed in paragraphs 7.47-7.51). The Commission does not intend requesting 2008/09 daily outage data from EDBs as it is not essential when specifying quality standards.

Draft Decision on Reference Dataset

- 7.26 The Commission’s draft decision is that daily SAIDI and SAIFI data from the period 1 April 2004 to 31 March 2009 be used to inform quality standards under the Reset DPP.

7.4 Accounting for Extreme Variability

- 7.27 The Commission considers that reliability data is susceptible to variation resulting from extreme events and normal data variability. Without measures to account for this inherent variability, quality standards might be breached frequently despite there being no material deterioration in underlying reliability performance. As discussed in paragraph 7.11, the Commission considers that quality standards should be structured so as to mitigate the potential for breaches caused by circumstances beyond the control of an EDB, thus promoting greater regulatory certainty. This potential for uncertainty is increased by two properties that are inherent in reliability data: the presence of extreme events and the influence of normal variability. A process to account for variation due to extreme events is discussed in paragraphs 7.28-7.52, while reducing the impact of normal variability is considered in paragraphs 7.53-7.67.

Preliminary Views on Extreme Variation

- 7.28 Extreme events such as severe weather can lead to SAIDI and SAIFI values being unrepresentative of the underlying service quality being provided by an EDB. In the Discussion Paper, the Commission suggested that it would be appropriate for quality standards to account for the impact of such events, as otherwise the assessment of reliability may not be representative of an EDB’s

³²⁰ Eastland, supra n 55, p. 25; ENA, supra n 18, paragraph 65; PwC, supra n 53, p. 37; and Vector, supra n 11, paragraph 139.

underlying performance. The approach proposed in the Discussion Paper would mitigate extreme events by reducing their impact when calculating the reliability targets.

- 7.29 The Commission has previously researched³²¹ how to account for the impact of extreme events when assessing reliability breaches under the Thresholds and a procedure to account for them is set out in the Supplementary Guidelines.³²²
- 7.30 Under the Supplementary Guidelines, the IEEE standard 1366-2003³²³ (“IEEE Standard”) is used to categorise extreme events on a network as Major Event Days (“MED”). The daily SAIDI and SAIFI values on an MED were to be replaced by the respective boundary value. This process of identifying MEDs and then adjusting the reliability data to account for the impact of MEDs is termed “normalisation”. This process was used to prepare normalised datasets when considering breaches of the reliability criterion as part of the Thresholds post-breach inquiry process.
- 7.31 In the Discussion Paper, the Commission proposed that the normalisation process described in the Supplementary Guidelines is an appropriate basis for an approach to account for extreme variability when setting and assessing quality standards under the Reset DPP.³²⁴

Submissions on Extreme Variation

- 7.32 Submissions supported the Commission’s proposal that EDB reliability data be normalised to account for extreme events.³²⁵ Vector, for example, submitted that it supported an approach that adjusts performance data to remove outages caused by extreme events.³²⁶

³²¹ A consultative report, *PBA System Reliability: Recommendations for extreme event criteria* was released September 20, 2005. Submissions were received from Counties Power, Orion, PwC, Powerco, Transpower, Unison, Vector, and WEL Networks.

³²² Commerce Commission, *Supplementary Guidelines for Investigating Breaches of the Reliability Criterion of the Quality Threshold*, 2 November 2007.

³²³ Institute of Electrical and Electronics Engineers (“IEEE”), *Guide for Electric Power Distribution Reliability Indices*. Refer: http://standards.ieee.org/reading/ieee/std_public/description/td/1366-2003_desc.html

³²⁴ Commerce Commission, supra n 16, p. 114.

³²⁵ For example, Eastland, supra n 55, p. 25; and Vector, supra n 11, paragraph 139.

³²⁶ Vector, *ibid*.

7.33 Submissions received from EDBs raised three main issues with the proposed normalisation process under the Reset DPP. These three issues are listed below and discussed in the following subsections:

- *Identifying Extreme Events*: the Commission’s proposed implementation of the IEEE Standard for the identification of MEDs;
- *Substitution for MEDs*: the manner in which MEDs are accounted for when normalising data; and
- *Normalisation of SAIFI Data*: the use of MEDs calculated with SAIDI data to normalise SAIFI values.

Identifying Extreme Events

7.34 The IEEE Standard identifies MEDs by comparing the SAIDI value on each day with a calculated SAIDI boundary value (i.e., a value calculated by applying a defined statistical procedure to reliability data, for further details see Appendix C). If the SAIDI value for the day exceeds the SAIDI boundary value, then the day is defined as an MED. Extreme events are considered to be the outage events that occur on an MED.

7.35 PwC suggested that the Commission refine its proposed approach for identifying extreme events and recommended that the Commission seriously consider the findings of the SRA Report. PwC noted that “the significance of breaching the DPP is greater than under the threshold regime.”³²⁷

7.36 SRA recommended that days that had been previously identified as MEDs should not be excluded from the SAIDI dataset when calculating the SAIDI boundary value.³²⁸ The Commission concurs with the view that excluding such days would not comply with the IEEE Standard and agrees that these days should not be excluded from the dataset.

7.37 A number of submissions raised the issue of how zero SAIDI days should be taken into account when calculating the SAIDI boundary value. For example, PwC claimed that there is a significant incidence of no event days and that this “distorts the results of the IEEE Standard for those EDBs with large numbers of no event days”.³²⁹ SRA evaluated the probability distribution of Auckland and Wellington SAIDI data for the period 1 April 2002 to 31 March 2007, and found the exclusion of zero SAIDI days to have a small impact on the size of the boundary value for Auckland and a larger impact for Wellington. SRA proposed that zero SAIDI values be accounted for in determining the SAIDI boundary value, and stated that “In essence, the Beta Method [IEEE Standard] assumes that the number of zero SAIDI days has little impact on the calculation [of the SAIDI boundary value]”.³³⁰ The

³²⁷ PwC, supra n 53, p. 38.

³²⁸ SRA, supra n 302, p. 8.

³²⁹ PwC, supra n 53, p. 37.

³³⁰ SRA, supra n 302, p. 8.

Commission notes that, as discussed further in paragraph 7.48, the IEEE working group specifically considered this issue when it reviewed the performance of the IEEE Standard against a range of different sized companies. In the review, the IEEE working group applied the method to companies with zero SAIDI days ranging from 10 to 290 per annum and determined that the number of zero SAIDI days had little effect on the calculation. The Commission considers that in order to identify MEDs, it is neither necessary nor desirable to contemplate days in which no outage occurs. The IEEE Standard explicitly prohibits the inclusion of no event days when calculating boundary values, stating “only those days that have a SAIDI/day value will be used to calculate the [boundary value] (do not include days that did not have any interruptions)”.³³¹

- 7.38 SRA’s evaluation of Auckland and Wellington SAIDI data found the log-normal approximations used in the IEEE Standard to be inadequate in both cases.³³² SRA found better fitting probability distributions for each set of data that were able to considerably reduce the size of the boundary. SRA recommended that the “assumption that non-zero daily SAIDI or SAIFI values follow a log-normal distribution be replaced by the assumption that they follow a more flexible family of distributions such as a mixture of log-normal distributions”.³³³
- 7.39 The Commission notes the SRA finding, including that it appears to have been based on a small subset of EDB data. The Commission considers that—as further analysis and data becomes available for EDBs—the appropriateness of the IEEE Standard log-normal distribution assumption could be reviewed for New Zealand EDBs. At this time, the Commission is satisfied that when identifying MEDs under the Reset DPP it should rely on the method outlined in the IEEE Standard. The Commission notes that the IEEE standard was developed specifically for use by regulators and utility management to assess outage data, and is considered to be effective for large and small distribution companies.³³⁴ The applicability of the IEEE Standard is further discussed in paragraph 7.48.

Substitution for MEDs

- 7.40 A number of submissions commented on the appropriate method to account for MEDs when normalising SAIDI and SAIFI data. In the Discussion Paper, the Commission proposed that the daily SAIDI and SAIFI values on each MED be treated based on the process set out in the Supplementary Guidelines.

³³¹ IEEE Power Engineering Society, *IEEE Guide for Electric Power Distribution Reliability Indices, IEEE Std 1366-2003*, 14 May 2004, p. 9.

³³² SRA, *supra* n 302, p. 9.

³³³ *ibid*, p. 1.

³³⁴ Warren, Cheryl A & Saint, Robert, IEEE Senior Members, “*IEEE Reliability Indices Standards*”, Jan/Feb 2005, p. 17.

- 7.41 Both Vector and PwC submitted that daily SAIDI values for MEDs should not be replaced by the boundary value.³³⁵ Vector suggested that this issue may be resolved if the MEDs were replaced by the average values or if those days were excluded altogether. Vector suggested that boundary value replacement would not provide EDBs with an incentive to restore supplies more quickly, since all minutes or interruptions above the boundary value are irrelevant once the boundary value has been exceeded. Vector also submitted that boundary value replacement discriminates against businesses that experienced comparatively few extreme weather events between 2005 and 2009. SRA commented that boundary value replacement means that many of the variability issues will remain in the data and places much greater importance on the estimation of the boundary value. SRA recommended that normal variation be assessed by excluding rather than substituting major event days, in keeping with the IEEE standard.³³⁶ The Commission notes that the chair of the IEEE working group stated that “it is important to remember that when using the 2.5 Beta Method [IEEE Standard], no data is excluded; instead it is classified, analysed, and reported on using separate processes”.³³⁷
- 7.42 The purpose of the IEEE Standard is “to allow major events to be studied separately from daily operation, and in the process, to better reveal trends on daily operation that would be hidden by the large statistical effect of major events.”³³⁸ The IEEE did not intend that extreme events would be excluded and not be considered by utilities and regulators. In describing the application of the IEEE Standard, the IEEE Working Group on System Design states that “it is anticipated that both executives and regulators will scrutinise those events that cause MEDs.”³³⁹ The Commission considers that scrutiny of extreme events is likely to be a relatively complex and costly exercise, thus a mechanism for undertaking detailed analysis of such events is unlikely to be appropriate under the Reset DPP. The Commission recognises that these events should be taken into account in some manner and considers that this can be achieved through boundary substitution.
- 7.43 An alternative substitution for MED values using average values would lead to major events being ‘considered’ to a lesser degree than some non-major events. While the exclusion of the SAIDI and SAIFI values for MEDs would conflict with the IEEE Standard by excluding extreme events from regulatory oversight. The Commission retains its view that a boundary substitution method should be incorporated into the quality standard. The Commission

³³⁵ PwC, supra n 53, p. 37; and Vector, supra n 11, paragraph 141.

³³⁶ SRA, supra n 302, pp. 9 and 11.

³³⁷ Warren, Cheryl A *et al*, supra n 334, p. 22.

³³⁸ IEEE Power Engineering Society, supra n 331, section 4.5.

³³⁹ Cheryl A. Warren *et al* on behalf of the Working Group on System Design, “*Classification of Major Event Days*”, 2001, p. 2.

considers that boundary value replacement will have a relatively neutral effect on compliance given the same boundary value is to be substituted into the data used to set standards and the data used to assess them.³⁴⁰

- 7.44 The intention of normalising for MEDs under the Reset DPP is to reduce the excessive impact that a major event can have on underlying reliability data. However, it is not the Commission's intention to exclude MEDs from consideration. The Commission considers that these (potentially conflicting) purposes are best served by substituting the value of MEDs with that of the boundary value.

Normalisation of SAIFI Data

- 7.45 Submissions expressed concern that the proposed normalisation approach for extreme events is designed solely around a SAIDI measure and does not use a SAIFI measure.³⁴¹ PwC commented that, as a breach of either SAIDI or SAIFI constitutes a breach of the quality component of the DPP, abnormal SAIFI events must also be considered in addition to abnormal SAIDI events. Vector analysed ten years of its own network data, concluding that "there have been no instances where SAIFI has breached independently of SAIDI".³⁴²
- 7.46 The Commission also notes that Vector's analysis suggests that, in respect of its networks, the proposed methodology for identifying MEDs is likely to capture the days on which SAIFI exceeds the SAIFI boundary. The Commission notes that the IEEE Standard specifies the use of SAIDI values (and not SAIFI) when determining which days are MEDs, as SAIDI better reflects the total cost of reliability events including utility repair costs and customers losses.³⁴³

Current Views on Extreme Variation

- 7.47 The Commission considers it appropriate that the quality standards under the Reset DPP account for extreme events. In the absence of such an approach, an assessment of network reliability using SAIDI and SAIFI indices may not be representative of an EDB's underlying performance when serving its customers.
- 7.48 The Commission considers that in order to mitigate the impact of extreme variation under the Reset DPP, it is appropriate to use the IEEE Standard to identify MEDs in both the Reference Dataset and assessment period data. The IEEE Standard was developed specifically for use by regulators and

³⁴⁰ The extent to which it has a neutral effect will depend on the relative frequency of extreme events during the assessment and reference periods.

³⁴¹ PwC, supra n 53, pp. 37-38; Vector, supra n 11, paragraph 149-151; and Wellington Electricity, supra n 42, p. 26.

³⁴² Vector, supra n 11, paragraph 150.

³⁴³ IEEE Power Engineering Society, supra n 331, Annex B1.

utility management³⁴⁴ and is an internationally recognised approach to identifying MEDs.³⁴⁵ It has been approved by the American National Standards Institute as an American National Standard.³⁴⁶ The standard has been subject to a review process in which it was tested with outage data from small utilities that ranged in size from 1,400 to 70,000 customers and had zero SAIDI days that across a range from 10 to 290 per annum. The review process concluded that the number of zero SAIDI days has little effect on the calculation and that by using it “a reasonable threshold value for MEDs can be determined for small utilities or districts with many zero SAIDI days, as well as for large utilities with few or no zero SAIDI days”.³⁴⁷

7.49 The Commission considers that a similar process to that used to consider breaches under the Thresholds should be used to normalise the Reference Dataset of daily SAIDI and SAIFI outage data. Specifically an EDB should:³⁴⁸

- use the method described in the IEEE Standard to calculate the SAIDI boundary value;
- use the method described in the IEEE Standard to identify the MEDs in the Reference Dataset;
- apply step 1 to the SAIFI outage data to identify the SAIFI boundary values;
- replace the daily SAIDI values on all identified MEDs with the SAIDI boundary value; and
- replace the daily SAIFI values on all identified MEDs with the SAIFI boundary value, if the daily SAIFI value exceeds the SAIFI boundary value.³⁴⁹

³⁴⁴ Warren, Cheryl A *et al*, supra n 334, p. 17.

³⁴⁵ For example, see Australian Electricity Regulator, “*Electricity distribution network service providers service target performance incentive scheme*”, June 2008; Joseph H. Eto and Kristina Hamachi LaCommare, “*Tracking the Reliability of the U.S. Electric Power System: An Assessment of Publicly Available Information Reported to State Public Utility Commissions*”, Ernest Orlando Lawrence Berkeley National Laboratory, October 2008.

³⁴⁶ IEEE Power Engineering Society, supra n 331, p. i.

³⁴⁷ Warren, Cheryl A *et al*, supra n 334, p. 21.

³⁴⁸ This process is described in further detail in Appendix C.

³⁴⁹ By definition, all daily SAIDI values that occur on an MED will be larger than the SAIDI boundary value. However, this relation does not necessarily hold true for daily SAIFI values and the SAIFI boundary value.

- 7.50 Reliability data from the relevant assessment period should be normalised using boundary values calculated from the Reference Dataset. Specifically the daily SAIDI and SAIFI values for the assessment period (“Assessment Dataset”) should be treated as follows:
- replace the daily SAIDI values on all identified MEDs (using the same method in the IEEE Standard used to identify the MEDs in the Reference Dataset) with the SAIDI boundary value; and
 - replace the daily SAIFI values on all identified MEDs with the SAIFI boundary value, if the daily SAIFI value exceeds the SAIFI boundary value.
- 7.51 The Commission notes that the extent to which substitution of the boundary value will have a negative impact on EDBs in any one year (e.g., if a relatively large number of MEDs are identified during an assessment period) will be tempered by the multi-year assessment approach described in paragraphs 7.76-7.79.

Draft Decision on Extreme Variation

- 7.52 The Commission’s draft decision is that the Reference Dataset and the annual Assessment Datasets should be normalised to take account of extreme events. This is to be done using the process described above and set out in detail in Appendix C.

7.5 Accounting for Normal Variability

- 7.53 When measured over short periods, such as a year, reliability indices will demonstrate statistical variation around a mean (this characteristic is referred to in this paper as “normal variability”). The Discussion Paper³⁵⁰ noted that normal variability is partly driven by external factors, e.g., damage caused by third parties or short term weather events. Accounting for the effect of normal variability in reliability indices is likely to provide a better reflection of underlying performance.
- 7.54 As discussed above, the Commission considers that the quality standards under the Reset DPP should take account of normal variability in reliability indices. Specifically, the Commission proposes that the SAIDI and SAIFI values against which annual EDB performance is assessed (“Reliability Targets”) should take account of normal variability observed in the Reference Dataset, so they better reflect the underlying reliability of the network.
- 7.55 In the Discussion Paper the Commission proposed two possible approaches to account for normal variability: the use of dead-bands and/or moving averages. The use of a dead-band is discussed below, while the potential use of a moving average is discussed in paragraphs 7.69 and 7.73.

³⁵⁰ Commerce Commission, *supra* n 16, p. 115.

Preliminary Views on the Use of Dead-bands

7.56 In the Discussion Paper the Commission’s preliminary view was that dead-bands could be employed to specify an acceptable range of performance above the average within which reliability performance could vary. The dead-band approach was considered appropriate as it would reduce the impact of normal variability present in the reliability data. The Commission proposed that the use of a dead-band around the annual averages of the normalised Reference Dataset should be considered for use under the Reset DPP and that the dead-band size could be:³⁵¹

- *based on a standard deviation calculation*: for each EDB the band would be a fixed multiple of the annual standard deviation of its normalised Reference Dataset;
- *a fixed percentage*: for each EDB the band would be defined as a set percentage of the average of its normalised Reference Dataset (e.g., 7.5%); or
- *an absolute value*: for each EDB the band would be defined as an absolute value, including an overs/unders adjustment to the band level based on performance in previously assessed years.

Submissions on the Use of Dead-bands

7.57 Submissions supported the proposal that the quality standards should seek to take account of normal variability. Submissions also agreed with the Commission’s proposal that this should be achieved by applying a dead-band around the historic annual SAIDI and SAIFI averages.³⁵² Unison stated that it agreed that dead-bands provide an appropriate statistical method to account for normal variability in the data. PwC supported, in principle, the use of a dead-band around the average historical reliability target and agreed that this approach is consistent with the benchmark of no material deterioration in quality. The SRA report agreed that dead-bands based on the daily data from the reference period should be used.

7.58 The majority of submissions considered that the size of the dead-bands should be based on a standard deviation calculation. The Commission agrees with PwC that the use of standard deviations to define the dead-band “is statistically more robust than the other options suggested”.³⁵³ Vector considered the use of standard deviations to be appropriate and that it provides “a statistically robust approach to setting a dead-band”.³⁵⁴ SRA estimated that a dead-band width of one standard deviation would be

³⁵¹ *ibid*, p. 116.

³⁵² For example, PwC, *supra* n 53, p. 38; Unison, *supra* n 41, p. 33; Vector, *supra* n 11, paragraphs 143-144; and SRA, *supra* n 302, p. 13.

³⁵³ PwC, *supra* n 53, p. 38.

³⁵⁴ Vector, *supra* n 11, paragraph 144.

consistent with accepting a 15.87% probability of a ‘false positive’ in any one year (assuming a normal distribution).³⁵⁵

- 7.59 Vector and SRA also considered that the other two methods proposed in the Discussion paper, fixed percentage and absolute value, do not have a reliable statistical basis and would not support the *Consistency Principle* as they would disadvantage firms with relatively more variable SAIDI and SAIFI performance. The Commission considers that this potential inconsistency is inappropriate and as such considers that the fixed percentage and the absolute value methods should not be further considered for use under the Reset DPP.

Current View on the Use of Dead-bands

- 7.60 The Commission’s current view is that setting Reliability Targets at the upper limit of an appropriately defined dead-band will reduce the potential for breaches caused by normal variability. The Commission notes that the use of a dead-band approach was supported by submissions.
- 7.61 The Commission considers that the size of the relevant dead-band should be defined as a fixed multiple of the standard deviation of the normalised Reference Dataset.³⁵⁶ The Commission considers that the number of standard deviations that are used to define the dead-band will effectively determine the number of false positives expected in each year, a view which is shared by Vector and SRA.³⁵⁷
- 7.62 The Commission is aware that similar approaches to the proposed dead-band have been used by regulators overseas, including in the United States. For example, the Massachusetts regulator has applied a dead-band of one standard deviation on a company’s historical performance.³⁵⁸ Dead-bands, though based on simple percentages, have also been used to set reliability targets in Italy³⁵⁹ and Hungary.³⁶⁰
- 7.63 The Commission considers that the size of the dead-band should take account of the overall assessment process. For example, the probability that normal variability would cause performance to exceed the Reliability Targets in each of two successive years would be relatively low. Submissions were of a similar view, for example Vector and SRA commented that the probability of “false positives” is reduced through a multi-year assessment (discussed

³⁵⁵ SRA, supra n 302, p.14.

³⁵⁶ The standard deviation of the normalised Reference Dataset should be calculated directly from daily rather than annualised daily data.

³⁵⁷ SRA, supra n 302, pp. 12-13; and Vector, supra n 11, paragraphs 146-147.

³⁵⁸ Massachusetts Department of Telecommunications and Energy 2001, *Investigation to Establish Guidelines for Service Quality Standards for Electric Distribution*, D.T.E.99-84, June 29, 2001.

³⁵⁹ Ajodhia V., Schiavo L.L. and Malaman R., 2006, *Quality regulation of electricity distribution in Italy: An evaluation study*, Energy Policy 34, p. 1478-1486.

³⁶⁰ Elena Fumagalli, Luca Lo Schiavo, Florence Delestre, *Service Quality Regulation in Electricity Distribution and Retail*, Springer, 2007.

further in paragraphs 7.76-7.79) rather than assessing performance on a single year basis.³⁶¹ The impact of different assessment schemes on the size of the dead-band is presented in Table 6 in Appendix C.

- 7.64 The Commission considers that the combined effect of an appropriately defined dead-band with a multi-year assessment framework will mitigate the potential for ‘false positives’. While a dead-band could be made sufficiently wide to manage the potential for ‘false positives’ alone, the Commission considers that a combined approach is more appropriate and can have an equivalent effect. In particular, the Commission considers that a combined approach would retain a greater degree of incentive and oversight as it retains a more stringent annual standard.
- 7.65 The Commission’s current view, taking into account the proposed multi-year assessment, is that a dead-band, one standard deviation wide, should be applied to the SAIDI and SAIFI average reference period values for each EDB. The upper limit of the respective SAIDI and SAIFI dead-bands would then be Reliability Targets against which the EDB’s annual performance would be assessed.
- 7.66 The Commission considers that there is limited potential for the Reliability Targets to become de facto performance standards that would allow EDBs to perform below historic levels, possibly resulting in ‘standards creep’.³⁶² The potential for EDB performance to deteriorate towards the upper limit is mitigated by the threat of penalties being imposed on an EDB following a breach. It is also doubtful that EDBs could sufficiently predict their reliability performance, given the historic variability of the data, to allow them to safely (i.e., without the risk of breach) move towards the upper limit. A multi-year assessment scheme reduces the need for a wide dead-band, and this should further limit the opportunity for ‘standards creep’. The Commission considers that by seeking to remain below the Reliability Targets, and given the inherent normal variability, EDBs will be incentivised to at least maintain previous performance levels.

³⁶¹ Vector, supra n 11, paragraph 147 and SRA, supra n 302, pp. 12-13.

³⁶² In this case, standards creep is the potential for performance (e.g., reliability) to gradually deteriorate over time towards a limit or standard.

Draft Decision on the Use of Dead-bands

7.67 The Commission's draft decision is that normal variability be taken into account when setting the Reliability Targets though the use of a dead-band. The size of the dead-band is to be based on the standard deviation present in the normalised Reference Dataset. Further detail on this process is set out in Appendix C. Specifically, an EDB's annual:

- *SAIDI Reliability Target*: will be set as the sum of the average SAIDI value in the normalised Reference Dataset and one (1) times the standard deviation of the SAIDI data in the normalised Reference Dataset; and
- *SAIFI Reliability Target*: will be set as the sum of the average SAIFI value in the normalised Reference Dataset and one (1) times the standard deviation of the SAIFI data in the normalised Reference Dataset.

7.6 Assessment of Compliance

7.68 The Commission considers that the quality standards should be set and assessed in a way that indicates whether material deterioration has occurred over time. The Commission considers that poor performance in a single year does not necessarily indicate an underlying trend of deteriorating performance. Reflecting this view, the Discussion Paper proposed that a breach of the quality-path should only occur where an EDB fails to meet its Reliability Targets across a number of years.³⁶³ This section sets out the Commission's proposed process for assessing compliance with the quality-path and sets out its associated draft decisions.

Preliminary View on the Assessment of Quality Standards

7.69 In the Discussion Paper, the Commission proposed that a time-based assessment could be implemented by including one or both of the following:³⁶⁴

- *Moving Averages*: an assessment of reliability performance based on a moving average of reliability performance over time (e.g. three years); and/or
- *Multi-year Assessment*: in which EDB compliance is assessed on the basis of the combined performance in individual years (i.e., a breach would only occur where an EDB fails to meet its reliability target across a number of years).

7.70 The Commission proposed that, at the end of each assessment period, EDBs would be required to submit whether they have complied with the time-based assessment of the quality-path. A breach of the quality-path would be

³⁶³ Commerce Commission, supra n 16, p. 118.

³⁶⁴ *ibid.*

considered in the same way as a breach of the price-path of the Reset DPP. The treatment of breaches will be further considered in the Enforcement Guidelines.

Submissions on the Assessment of Quality Standards

- 7.71 As discussed in paragraphs 7.7-7.10, submissions to the Discussion Paper approved of the Commission's general approach to defining quality standards. Vector's submission, for example, stated that "Vector is supportive of the principle behind the Commission's proposed approaches to detect material deteriorations in performance. It is desirable to make allowances for extreme events and statistical variation to avoid unnecessary breaches."³⁶⁵
- 7.72 In relation to compliance assessment, submissions stated that the Commission should further consider mechanisms that would seek to further reduce the impact of normal variability and to consider performance over a number of assessment periods.³⁶⁶ A number of EDBs also voiced their support for the SRA report, which recommended that "procedures such as a simple 'two in a row' approach be adopted to enhance transparency while retaining flexibility in setting dead-band upper limits and controlling false-positive rates". The Commission considers that such "procedures" include the "two out of three" multi-year assessment proposed in the Discussion Paper.
- 7.73 SRA raised concerns with the use of a moving average approach.³⁶⁷ These concerns included how a moving average should be calculated during the first two years of the regulatory period, its interaction with dead-bands and that its impact on the potential for false positives may not be straightforward to assess. The Commission agrees that the apparent simplicity of a moving average approach may not extend to assessing its impact, which is not readily predictable. Unison also had reservations about the use of a moving average approach, stating that it "introduces the prospect of the standard "creeping" over time—either up or down depending on the performance of the EDB".³⁶⁸ PwC was not in favour of the use of a moving average using five years data.³⁶⁹
- 7.74 Vector submitted "that multi-year assessments in combination with dead-bands can assist in mitigating the probability of false positives". The Commission agrees with Vector's position that "the advantage of this multi-

³⁶⁵ Vector, supra n 11, paragraph 12(a).

³⁶⁶ For example, Eastland, supra n 55, p. 25; and PwC, supra n 53, p. 39.

³⁶⁷ SRA, supra n 302, p. 15.

³⁶⁸ Unison, supra n 41, p. 32.

³⁶⁹ PwC, supra n 53, p. 37.

year approach is that it reduces the probability of false positives significantly, without increasing the dead-band in any given year.”³⁷⁰

- 7.75 In relation to the “two out of three” assessment, SRA questioned the need for its “added complication” when compared to a simpler “two in a row” approach.³⁷¹ The Commission considers that the use of the “two out of three” assessment is preferable to the “two in a row” approach as it sets a higher performance standard. As an example, an EDB that fails to meet its Reliability Target every alternate year over a five-year regulatory period would satisfy the quality standards under a “two in a row” scheme, while it would fail to satisfy the quality standards twice under a “two out of three” assessment. The Commission considers that allowing EDBs to breach in 60% of the assessment periods in a regulatory period would not promote nor be consistent with a no material deterioration outcome.

Current View on the Assessment of Quality Standards

- 7.76 The Commission considers that the combined effect of the dead-band approach and the “two out of three” assessment will mitigate the potential for breaches to occur as a result of normal variability. The Commission considers that the “two out of three” assessment would adequately deal with variability in performance data while retaining a sufficient degree of oversight of an EDB’s quality performance. This approach is consistent with seeking to focus on underlying performance over time and will identify sustained, rather than transitory, deterioration. The combined effect of these methods is set out in Table 6 in Appendix C.
- 7.77 The Commission’s current view is that an EDB should calculate, using the normalised Assessment Dataset, aggregate SAIDI and SAIFI values for the assessment period (“Assessed Values”). The EDB will then compare each Assessed Value with its respective Reliability Target.
- 7.78 The Commission proposes that an EDB would comply with its quality-path during a particular assessment period, if:
- both the Assessed Values for the assessment period are less than or equal to the respective Reliability Targets (i.e., it meets the Reliability Targets); or
 - the Assessed Values in the previous two assessment periods did not exceed the respective Reliability Targets.
- 7.79 If an EDB fails to meet its Reliability Targets in the current assessment period and in any one of the two previous assessment periods, then it would be in breach of its quality-path.³⁷² Under this approach an EDB would need

³⁷⁰ Vector, supra n 11, paragraph 147.

³⁷¹ SRA, supra n 302, p. 15.

³⁷² If an Assessed Value exceeded its respective Reliability Target in both of the previous two assessment years, then the breach would have occurred a year earlier.

to meet its Reliability Target for no less than two consecutive years. Moreover, acceptable performance alternating with unacceptable performance on a year by year basis would not be sufficient to satisfy the requirements of such a quality-path, as it would under a “two in a row” approach.

Draft Decision

- 7.80 The Commission’s draft decision is that an EDB would have complied with the quality standard during a particular assessment period if:
- its SAIDI and SAIFI Assessed Values for the assessment period are both less than or equal to the respective Reliability Targets; or
 - its SAIDI and SAIFI Assessed Values in the previous two extant assessment periods did not exceed the respective Reliability Targets.
- 7.81 This assessment process is set out in further detail, including worked examples, in Appendix C.

SECTION 4: FORM OF THE DETERMINATION

CHAPTER 8: INITIAL RESET DETERMINATION

8.1 This chapter sets out the Commission's draft decisions on the proposed form and content for the Initial Reset Determination.

8.1 Introduction

8.2 The Commission is required to make a section 52P determination that gives effect to its decisions on the Reset DPP.³⁷³ Regarding the content of such a Determination, section 52P sets out generic requirements, while section 53M and section 53O set out specific requirements for a DPP. The content listed in these provisions is not exhaustive, and a number of additional items may be appropriate.

8.3 This chapter includes proposals on how draft decisions might be given effect in the Initial Reset Determination. This material is indicative only and, as such, this chapter does not represent a draft of the Initial Reset Determination. As set out in paragraph 1.4, the Commission intends to consult on a draft of the Initial Reset Determination in November 2009.³⁷⁴ Discussion on the proposed form and content for the Initial Reset Determination is set out in this chapter as follows:

- *Form of the Determination*: whether the Initial Reset Determination should consist of a single document that applies to all EDBs;
- *Regulatory Period*: the proposed period for which the Reset DPP will apply;
- *Suppliers Subject to the Initial Reset Determination*: the Commission's proposals on how EDBs to be regulated should be specified;
- *Applicable Input Methodologies*: the specification of relevant input methodologies;
- *Price-path*: the Commission's proposals on how the price-path and its elements are to be specified;
- *Quality-path*: the Commission's proposals on the specification of the quality-path; and
- *Relevant Dates*: these include the annual compliance date and annual CPP proposal date.

³⁷³ supra n 5, section 52P(1).

³⁷⁴ The Commission may publish a draft prior to this time for a separate consultation. Submissions on this Draft Decisions Paper will inform whether this is appropriate.

8.2 Form of the Determination

8.4 The Commission may make a single Determination or multiple Determinations to address matters relating to the Reset DPP. In addition, different parts of the Determination may come into effect at different times.³⁷⁵ In the Discussion Paper, the Commission stated that its preliminary view was that it should publish a single Determination addressing all EDBs subject to the Reset DPP.³⁷⁶

Submissions on the Form of the Determination

8.5 In general, submissions supported the Commission's proposal to implement the Reset DPP using a single Determination.³⁷⁷ Unison, in particular, commented that there are likely to be less transaction costs associated with this approach, which would be beneficial to all EDBs.³⁷⁸ The Commission considers that the generic nature of a DPP, with elements common to all EDBs, supports the specification of the Reset DPP using a single Determination.³⁷⁹

8.6 Unison and Orion suggested the Commission consider separate Determinations for those EDBs subject to price-quality regulation and those that are exempt, specifying all the regulatory requirements that apply to those particular EDBs under Part 4 (i.e., including information disclosure requirements).³⁸⁰ The Commission does not consider this approach appropriate given that decisions on the different regulatory instruments that apply to EDBs will apply at different times and relate to different subparts of the Act.

Draft Decision on the Form of the Determination

8.7 The Commission proposes to publish a single Determination to give effect to its decisions on the Reset DPP.

8.3 Regulatory Period

8.8 Section 53M(1)(c) requires that the Determination specify the length of the regulatory period to which a DPP applies. Section 53M(4) and (5) further specifies that this period must be five years, unless the Commission considers that a shorter period, of not less than four years, would better meet the Part 4 Purpose.

³⁷⁵ supra n 5, section 52P(4).

³⁷⁶ Commerce Commission, supra n 16, p.22.

³⁷⁷ ENA, supra n 18, paragraph 10; Unison, supra n 41, p. 2; Vector, supra n 11, paragraph 20; PwC, supra n 53, p.9; Wellington Electricity, supra n 42, p. 5; and Powerco, supra n 15, p.14.

³⁷⁸ Unison, supra n 41, p. 2.

³⁷⁹ The Commission notes that information disclosure requirements will be published in a separate Determination. See Commerce Commission, supra n 313 for more details on the application of information disclosure regulation under Part 4.

³⁸⁰ Unison, supra n 41, p. 2; and Orion, supra n 21, p. 20.

- 8.9 The Commission's preliminary view was that the regulatory period should be five years.³⁸¹ The Commission considered that this timeframe is consistent with the regulatory periods used under the Thresholds and also with regulatory periods adopted by overseas jurisdictions (e.g., Ofgem's distribution price controls). The Commission also stated that this longer regulatory period is likely to provide greater certainty for suppliers.

Submissions on the Regulatory Period

- 8.10 In general, submissions were supportive of the Commission's preliminary view that the regulatory period be set at five years.³⁸² ENA and Orion, however, proposed an alternative four-year regulatory period should the Commission decide not to make any starting price adjustments following the publication of input methodology determinations.³⁸³
- 8.11 The Commission considers that a five-year regulatory period is appropriate, as a longer timeframe is likely to provide greater certainty for EDBs. The timeframe is also consistent with the length of regulatory periods adopted by overseas jurisdictions and the period previously employed under the Thresholds. In respect of the four-year regulatory period suggested by ENA and Orion, the Commission proposes to make an adjustment to starting price following the publication of input methodology determinations. The timing of this adjustment is discussed in paragraph 5.33.

Draft Decision on the Regulatory Period

- 8.12 The Commission proposes that the Initial Reset Determination will specify the commencement date as 1 April 2010. The Commission's draft decision is that the regulatory period for the Reset DPP be five years from the commencement date (i.e., for the period 1 April 2010 to 31 March 2015).

8.4 Suppliers subject to the Initial Reset Determination

- 8.13 As suppliers of electricity distribution services, EDBs are subject to default/customised price-quality regulation under section 54G(1), unless they meet the consumer-owned exemption criteria set out in section 54D. EDBs subject to the Reset DPP must comply with the requirements of the Initial Reset Determination until it no longer applies (e.g., if a CPP is applied to an EDB or when the Reset DPP expires).
- 8.14 The Commission has set out its views on the treatment of consumer-owned EDBs under section 54D in a previous paper.³⁸⁴ When specifying which

³⁸¹ Commerce Commission, supra n 16, p. 24.

³⁸² Eastland, supra n 55, p.8; ENA, supra n 18, paragraph 10; Powerco, supra n 15, p.15; and Unison, supra n 41, p. 2.

³⁸³ ENA, *Submission on Potential Reset of DPP and Clawback Subsequent to Input Methodologies*, 18 May 2009, p.10; and Orion, supra n 21, p. 21.

³⁸⁴ supra n 1.

EDBs the Determination applies to, the Commission will apply the interpretation of section 54D set out in that paper.

- 8.15 The Commission proposes that EDBs subject to the Initial Reset Determination will be specified as suppliers of Electricity Distribution Services, except those defined as Consumer-Owned.

8.5 Applicable Input Methodologies

- 8.16 The Commission is required by section 52P(3)(c) to specify all relevant input methodologies that apply when making a Determination. However, as no input methodology determinations will have been published prior to the commencement of the Reset DPP, no input methodologies will be specified in the Initial Reset Determination.
- 8.17 The Commission proposes, if appropriate, to include a provision in the Initial Reset Determination that states it will be amended to specify any applicable input methodologies as soon as practicable after those methodologies are published.

8.6 Price-Path

- 8.18 The Commission is required to specify starting prices and rates of change when setting maximum prices for EDBs. Discussion on the overall form of the price-path is set out in Chapter 4, while the Commission's proposals for starting prices and rates of change are set out in Chapters 5 and 6 respectively. This section discusses the specification of the price-path in the Initial Reset Determination, which include matters relating to price (i.e., how price is defined and starting prices), the rate of change and the price-path assessment formula (including individual elements of this formula).

Price

- 8.19 As set out in paragraph 4.31, the Commission's draft decision is that it is appropriate to base the definition of price under the Reset DPP on that specified in the Thresholds Notice. The Initial Reset Determination would then define price as "a posted price in nominal terms (such as a tariff, fee or charge) or a component thereof, that an EDB charges in relation to a regulated service (and which may include discounts, provided those discounts are disclosed in accordance with relevant information disclosure requirements)." This definition of price should, however, exclude any pass-throughs where the EDB demonstrates that they were passed on transparently to its customers and/or electricity retailers.
- 8.20 As set out in paragraph 5.44, the Commission's draft decision is that starting prices under the price-path will be the Actual Prices applying on 31 March 2010. The Commission intends to reflect in the Initial Reset Determination that these Actual Prices are those being charged by the EDB as at 31 March 2010. These starting prices will relate to the $P_{i,t-1}$ term in the price-path assessment formula (discussed further in paragraph 8.23) for the assessment period 1 April 2010 to 31 March 2011. This is discussed further in paragraph 4.81.
- 8.21 As set out in paragraph 5.14 and 5.33, the Commission proposes that starting price adjustments should be considered for EDBs under the Reset DPP and that any potential adjustment should take place following the publication of

input methodology determinations respectively. The Commission proposes to reflect that starting prices will be adjusted as soon as practicable after the publication of the relevant input methodology determination in the Initial Reset Determination. Adjustments to starting prices will need to be specified for the individual EDBs to which they apply, potentially in a schedule to the amended Initial Reset Determination.

Rate of Change

8.22 Set out in paragraph 6.136 is the Commission's draft decision to set a single X-factor for all EDBs at 0% per annum. The rate of change is the X-factor in the price-path assessment formula for the regulatory period. Following adjustments to starting prices, it may be preferable to implement the adjustments through an alternative rate of change for a particular EDB. Alternative rates of change and the affected EDB would need to be specified in the amended Initial Reset Determination.

Price-path Assessment

8.23 As set out in paragraph 4.82, the Commission's draft decision is to implement a price-path assessment formula that assesses EDB compliance by comparing an EDB's notional revenue with its allowable revenue value. The formula and its components are discussed in detail in Appendix B. The proposed formula includes draft decisions on a number of issues, including:

- indexation of the price-path using a CPI-X mechanism (see paragraph 4.12);
- the use of a weighted average price-cap (see paragraph 4.19);
- the use of an annually updated base quantity (see paragraphs 4.43-4.44);
- the use of a lagged CPI (see paragraph 4.53); and
- accounting for pass-through costs (see paragraphs 4.61-4.62 and 4.71).

8.24 The Commission proposes that the price-path assessment formula in the Initial Reset Determination be based on Formula 7 in Appendix B.

CPI Indexation

8.25 The Commission's draft decision is to implement a six-month lagged CPI to measure compliance with the price-path assessment formula. In the Initial Reset Determination, the Commission intends to specify that Formula 8 in Appendix B be used to derive CPI.

Pass-Through Costs

8.26 The Commission's draft decision is that transmission charges, local authority rates, Commerce Act levies and Electricity Commission levies be treated as pass-through costs.

- 8.27 In the Initial Reset Determination, the Commission proposes that pass-through costs be defined such that they include “transmission charges, local authority rates, Commerce Act levies³⁸⁵ and Electricity Commission levies paid or payable by the EDB for that assessment period”. Pass-through costs should exclude amounts of these costs if the EDB demonstrates that those amounts were passed on transparently to its customers and/or electricity retailers.

8.7 Quality Standards

- 8.28 Quality standards under the Reset DPP are discussed in Chapter 7, the relevant draft decisions from that chapter and the manner in which they will be incorporated into the Initial Reset Determination are set out below.

Reliability Targets

Reference Dataset

- 8.29 As set out in paragraph 7.26, the Commission’s draft decision is that quality standards be based on SAIDI and SAIFI reliability indices from a Reference Dataset (i.e., historic daily SAIDI and SAIFI data for the period 1 April 2004 to 31 March 2009).
- 8.30 The Commission proposes that the Initial Reset Determination would reflect these decisions by requiring EDBs to complete the process referred to as “Step RT1: *Assemble Reference Dataset*” in Appendix C.

Normalisation of Reference Dataset

- 8.31 As set out in paragraph 7.47, the Commission considers it appropriate to take account of extreme variability in the Reference Dataset. Major event days are to be identified in the Reference Dataset using the method specified under the IEEE Standard and replaced with appropriate boundary values.
- 8.32 The Commission proposes that the Initial Reset Determination would reflect these decisions by requiring EDBs to complete the following processes, described in Appendix C:
- Step RT2: *Calculate the SAIDI and SAIFI boundary values;*
 - Step RT3: *Identify the Major Event Days;* and
 - Step RT4: *Prepare the Normalised Reference Dataset.*

³⁸⁵ As discussed in paragraph 4.62, it is proposed that during the Reset DPP this will extend to Commerce Act levies paid by EDBs during the Initial DPP, see Appendix B.

Calculating Reliability Targets

8.33 To account for normal variability in the Reference Dataset, the Commission proposes to incorporate dead-bands when setting Reliability Targets, as set out in paragraph 7.67. The Commission proposes that the Initial Reset Determination would reflect this by requiring EDBs to complete the following processes, described in Appendix C:

- Step RT5: *Calculate the SAIDI and SAIFI Dead-bands*; and
- Step RT6: *Calculate the SAIDI and SAIFI Reliability Targets*.

Annual Assessment Process

Assessment Dataset

8.34 As described in paragraph 7.77, an Assessment Dataset (i.e., daily SAIDI and SAIFI data for the assessment period) should be used to derive Assessed Values (i.e., aggregate SAIDI and SAIFI values for the assessment period) that are to be compared against the Reliability Targets.

8.35 The Commission proposes that the use of an Assessment Dataset will be reflected in the Initial Reset Determination by requiring EDBs to complete the process referred to as “Step AA1: *Assemble Assessment Dataset*” in Appendix C.

Normalisation of Assessment Dataset

8.36 The Commission considers it appropriate to take account of extreme variability in the Assessment Dataset. MEDs are to be identified in the Assessment Dataset and replaced with appropriate boundary values derived using Step RT2.

8.37 The Commission proposes that the Initial Reset Determination would reflect these decisions by requiring EDBs to complete the following processes, described in Appendix C:

- Step AA2: *Identify Major Event Days*; and
- Step AA3: *Prepare the Normalised Assessment Dataset*.

Assessing Compliance against Reliability Targets

8.38 As discussed in paragraph 7.80, the Commission’s draft decision is that an EDB’s Assessed Values be compared with its Reliability Targets when assessing compliance. If necessary it should then apply the “two out of three” rule. The Commission proposes that the Initial Reset Determination would reflect this by requiring EDBs to complete the following processes described in Appendix C:

- Step AA4: *Calculate the Assessed Values*;
- Step AA5: *Compare the Assessed Values with the Reliability Targets*; and
- Step AA6: *Apply Multi-year Assessment Process*.

8.8 Relevant Dates

Annual Compliance Date

8.39 The Initial Reset Determination must specify the annual date by which compliance must be demonstrated.³⁸⁶ In the Discussion Paper, the Commission's preliminary view was to require that compliance documentation be submitted within 35 working days of the conclusion of each assessment period (i.e., within 35 working days following 31 March). The Commission stated that this period should allow sufficient time following the year end for EDBs to coordinate the relevant information and fulfil their compliance obligations.³⁸⁷

Submissions on Annual Compliance Date

8.40 The Commission received several submissions on its proposed annual compliance date, reflecting a wide array of views.³⁸⁸ Vector, Powerco and Eastland considered the proposed 35 working days to be reasonable. Generally, however, submissions considered that the proposed 35 working days should be extended, as the compliance workload and audit requirements may initially be greater under a DPP than under the Thresholds.

8.41 ENA, PwC and Unison suggested that the period be extended to 50 working days, whilst Wellington Electricity suggested that the period should be three months. Orion submitted that the period should be five months, so as to align the timing of the Reset DPP compliance statement with information disclosure requirements.

8.42 The Commission acknowledges that the Reset DPP, in order to increase certainty for EDBs, may require additional compliance steps than were present under the Thresholds. Having considered submissions, the Commission considers that an extension to the period is warranted. The Commission considers that 50 working days is an appropriate period of time to enable EDBs to meet their annual compliance obligations under the Reset DPP. Regarding the alignment of compliance disclosure dates, as proposed by Orion, the Commission considers that it is more appropriate to stagger compliance obligations.

Draft Decision on Annual Compliance Date

8.43 The Commission's draft decision is to require compliance related documentation to be submitted within 50 working days of each assessment date in the regulatory period (i.e., within 50 working days of 31 March).

³⁸⁶ supra n 5, section 53O(f).

³⁸⁷ Commerce Commission, supra n 16, p. 24.

³⁸⁸ Aurora, supra n 19, p. 22; Orion, supra n 21, p. 21, PwC, supra n 53, p. 9; Wellington Electricity, p. 5; and ENA, supra n 18, p. 17.

- 8.44 The Commission proposes that the Initial Reset Determination will specify the assessment date as 31 March for each year in the regulatory period. In addition, the Commission proposes that the Initial Reset Determination will specify that each EDB has 50 working days following each assessment date to demonstrate compliance with both the price-path and quality-path.

Annual CPP Proposal Date

- 8.45 Default/customised price-quality regulation allows suppliers subject to a DPP to apply for a CPP. In accordance with section 53Q(2)(b), the Initial Reset Determination must include the period within which, or the annual date by which, EDBs are to submit CPP proposals to the Commission.

The Commission's Current View on the Annual CPP Proposal Date

- 8.46 Requirements that must be met by EDBs when making CPP proposals are to be determined as part of the input methodologies work programme. As such the appropriate annual CPP proposal date will, to a large extent, depend on the outcome of the input methodologies process. In particular, the timing of the annual date is likely to reflect the CPP proposal assessment process and, if possible, align the CPP commencement date with the beginning of the EDB pricing year (i.e., 1 April).
- 8.47 Given the interrelationship with input methodologies, the Commission's view is that the Initial Reset Determination will not specify an annual submission date for CPP proposals until after the publication of input methodology determinations. This will not disadvantage EDBs as, under section 54P, no EDB can make a CPP proposal before input methodology determinations have been published. The Commission intends to amend the Reset DPP after the input methodology determinations to reflect the outcome of the input methodologies process.

Draft Decision on the Annual CPP Proposal Date

- 8.48 The Commission's draft decision is to not specify an annual submission date for CPP proposals until the relevant input methodology has been published.
- 8.49 The Commission proposes to include a provision in the Initial Reset Determination indicating that the Commission will amend the Initial Reset Determination to specify the annual CPP proposal date as soon as practicable after the relevant input methodology is published.

SECTION 5: APPENDICES

APPENDIX A: GLOSSARY

LIST OF TERMS, ABBREVIATIONS AND ACRONYMS	
Act, The	Commerce Act 1986
Actual Prices	The prices charged by EDBs as at 31 March 2010
AER	Australian Energy Regulator
Allowed Prices	The prices allowed under the respective EDB thresholds under the Initial DPP
Assessment Dataset	The set of daily SAIDI and SAIFI values for an assessment period
Assessed Values	Aggregate SAIDI and SAIFI values for an assessment period
B-factor	A factor applied to all EDBs under the Thresholds based industry wide productivity growth. The factor was derived from a TFP analysis of industry productivity growth, adjusted against productivity growth in the economy as a whole
C ₂ -factor	A factor applied under the Thresholds to reflect the relative profitability performance of an EDB's residual rate of return
Claw-back	Provision under section 52D of the Act which the Commission may require a supplier to lower its prices on a temporary basis in order to compensate consumers for some or all of any over-recovery that occurred under the prices previously charged by the supplier, or by allowing a supplier to recover some or all of any shortfall in its revenues that occurred under the prices previously charged by the supplier
Commission, The	The Commerce Commission
Commerce Act Levies	Levies set under the section 53ZE of the Commerce Act 1986
Consumer-owned EDBs	EDBs exempt from price-quality regulation on the basis of the consumer ownership criterion as set out in section 54D of the Act
CPI	Consumer Price Index
CPP	Customised price-quality path
Determination	A determination made under section 52P of the Act that sets out the relevant requirements of a DPP
DHC	(Un-indexed) depreciated historic cost
Discussion Paper	Commission consultation paper, <i>Reset of Default Price-quality Path for Electricity Distribution Businesses – Discussion Paper</i> , published 19 June 2009
DPP	Default price-quality path

LIST OF TERMS, ABBREVIATIONS AND ACRONYMS	
Draft Decisions Paper	Commission consultation paper, <i>Reset of Default Price-quality Path for Electricity Distribution Businesses – Draft Decisions Paper</i>
EECA	Energy Efficiency and Conservation Authority
EDB	Electricity distribution business: a lines business providing electricity distribution services subject to default/customised price-quality regulation.
ENA	Electricity Networks Association
FCM	Financial Capital Maintenance
Gazette	The <i>New Zealand Gazette</i> published by the Department of Internal Affairs
GPS	Government Policy Statements. Statements of economic policy transmitted in writing to the Commission by the Minister of Commerce under s26 of the Commerce Act 1986
IEEE	Institute of Electrical and Electronics Engineers
IEEE Standard	Standard 1366-2003 developed by the Institute of Electrical and Electronics Engineers to account for extreme events
IHC	Indexed historic cost
IEEE Standard	Standard 1366-2003 developed by the Institute of Electrical and Electronics Engineers
Initial DPP	The DPP applying from 1 April 2009 to 31 March 2010
Initial Reset Determination	The section 52P determination giving effect to the Reset DPP taking effect 1 April 2010
km	Kilometre
kVA	Kilovolt-amperes (a measure of electrical capacity and apparent power)
MED	Major Event Days
MEUG	Major Electricity Users Group
MVA	Megavolt-amperes (a thousand kilovolt-amperes)
NPV	Net present value
ODV	Optimised Deprival Value
Ofgem	Office of the gas and electricity markets: UK regulatory body
Opex	Operating expenditure: costs of the day to day operation of the network such as staff costs, maintenance expenditures, and overhead

LIST OF TERMS, ABBREVIATIONS AND ACRONYMS	
Part 4	Part 4 of the Commerce Act 1986 under which the Commission has responsibility for default/customised price-quality regulation
Part 4 Purpose	The purpose of the Part 4 regime as set out in section 52A of the Act
Part 4A	Part 4A of the Commerce Act 1986 (provisions applicable to electricity lines businesses), which commenced on 8 August 2001 and was repealed under by the Commerce Amendment Act 2008 on 16 September 2008
PEG	Pacific Economics Group
Post-breach inquiry	Process the Commission works through in order to decide whether or not to declare control on an EDB (Part 4A and Initial DPP)
Process Paper	Commission consultation paper: <i>Reset of Default Price-quality Path for Electricity Distribution Businesses – Process Paper</i> on 30 March 2009
Productivity Report	Economic Insights' report to the Commission on the appropriate X-factor under the Reset DPP
Provisions Paper	Commission consultation paper: <i>Regulatory Provisions of the Commerce Act 1986 Discussion Paper</i> , published 19 December 2008
RAB	Regulatory asset base
Rate of Change	A rate of change or X-factor, 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
Reference Dataset	The daily SAIDI and SAIFI outage data for the reference period 1 April 2004–31 March 2009
Reliability Targets	The annual SAIDI and SAIFI values against which EDBs reliability performance is assessed
Reset DPP	The DPP applying to EDBs for the 2010-2015 regulatory period
SAIDI	System average interruption duration index. A measure of the average time for which supply is off
SAIFI	System average interruption frequency index. A measure of how often consumers are affected by interruptions
Section 53K Purpose	Purpose of default/customised price-quality regulation as set out in Section 53K of the Commerce Act 1986
S-factor	Method for calculating an adjustment to the X-factor under incentive-based CPI-X price control, such that EDBs are provided explicit incentives to improve (and in some cases reduce) quality

LIST OF TERMS, ABBREVIATIONS AND ACRONYMS	
SRA	Statistics Research Associates Limited
Starting Prices	Prices to be specified as part of a section 52P determination that must either be prices at the end of the preceding regulatory period or those determined by the Commission
TFP	Total factor productivity. Change in productivity overtime, measured by the change in the ratio of outputs to inputs
Thresholds	The Part 4A thresholds regime
Thresholds Notice	Commerce Act (Electricity Distribution Thresholds) Notice 2004
Transpower	Transpower New Zealand Limited. The state-owned enterprise that operates New Zealand's high-voltage transmission network
Two in a row	Quality path multi-year assessment scheme, where Reliability Target compliance occurs for no less than two consecutive years
Two out of three	Quality path multi-year assessment scheme, where Reliability Target compliance occurs for no less than two out of three consecutive years
X-factor	Efficiency factor. Under a CPI-X control a regulated business may increase average annual prices by no more than CPI, less an annual percentage X
WACC	Weighted average cost of capital
2009 GPS	Government Policy Statement on Electricity Governance, May 2009
2006 GPS	Government Policy Statement on Incentives of Regulated Businesses to Invest in Infrastructure, August 2006
2004 ODVs	Updated ODV valuation, as at 31 March 2004

APPENDIX B: PRICE-PATH FORMULAE

B1 The Commission's draft decisions on the form and content of the price-path are set out in Chapter 4. This appendix outlines how each term of the assessment formulae is derived and how they are to be applied under the Reset DPP.

Price-path Compliance Assessment

B2 As discussed in Chapter 4, the Commission's draft decision is that an EDB's notional revenue under the Reset DPP is to be compared with its allowable revenue as set by its CPI-X price-path. For each assessment period the Commission will assess whether an EDB has complied with the price-path by determining whether its notional revenue exceeded its allowable notional revenue. The price-path assessment formulae and the definitions of its component are set out below.

Formula 7 Price-Path Assessment Formula

The notional revenue (NR_t) of an EDB at each assessment date is to not exceed the allowable notional revenue (R_t) of an EDB under the CPI-X price-path at that assessment date, such that:

$$\frac{NR_t}{R_t} \leq 1$$

NR_t is the *notional revenue* for the assessment period t , being equal to:

$$\sum_i P_{i,t} Q_{i,t-1} - K_t;$$

R_t is the *allowable notional revenue* under the CPI-X price-path for the assessment period t , being equal to:

$$\left(\sum_i P_{i,t-1} Q_{i,t-1} - K_{t-1} \right) \times (1 + \Delta CPI)(1 - X)$$

where

t denotes the calendar year during which the assessment date occurs;

i denotes each regulated service;

$P_{i,t}$ the price of service i at the assessment date occurring in calendar year t ;

$P_{i,t-1}$ the price of service i at the assessment date occurring in calendar year $t-1$;

$Q_{i,t-1}$ the base quantity for service i in year t , which is the quantity of service i provided in assessment period $t-1$;

K_t the sum of all pass-through costs during the assessment period t ;

K_{t-1} the sum of all pass-through costs during the assessment period $t-1$;

X the rate of change or X-factor (as specified for the EDB); and

ΔCPI_t the derived change in the consumer price index over the assessment period t (see Formula 8).

Individual Elements of the Assessment Formulae

- B3 The component terms of the notional revenue and allowable notional revenue formulae, discussed below, include:
- price and the rate of change;
 - quantity;
 - pass-through costs; and
 - indexation.
- B4 The objective of the assessment formula is to test whether the weighted average price of the current assessment year (P_t) has exceeded the previous year's price (P_{t-1}) adjusted for both inflation and the X-factor (i.e., $(1 + \Delta \text{CPI})(1 - X)$). The formula also accounts for the relative difference in pass-through costs, i.e., between K_t and the previous year's pass-through costs K_{t-1} adjusted by $(1 + \Delta \text{CPI})(1 - X)$.

Price and the Rate of Change

- B5 The Commission's draft decision is that a definition of price based on that used under the Thresholds remains appropriate for the Reset DPP. As discussed in Chapter 5, the Commission's draft decision is that starting prices, under the Reset DPP (i.e., as at 1 April 2010), should initially be specified as the price that applied at the end of the preceding regulatory period (i.e., as at 31 March 2010).
- B6 As discussed in Chapter 6, the Commission's draft decision is to set a single rate of change to apply to all EDBs during the Reset DPP, based on a proposed X-factor value of 0%.
- B7 Further to the discussion in paragraph 4.81, the Commission considers that in the initial assessment period,³⁸⁹ $P_{i, t-1}$ (i.e., the actual i^{th} price at the end of the preceding regulatory period) is to be used to define the i^{th} starting price at 1 April 2010. For clarity, the price during the assessment period (i.e., $P_{i, t}$) may vary from this starting price, subject to the overall price-path constraint. Price setting for the purposes of compliance in subsequent assessment periods will be relatively straightforward, using a derived $P_{i, t-1}$.

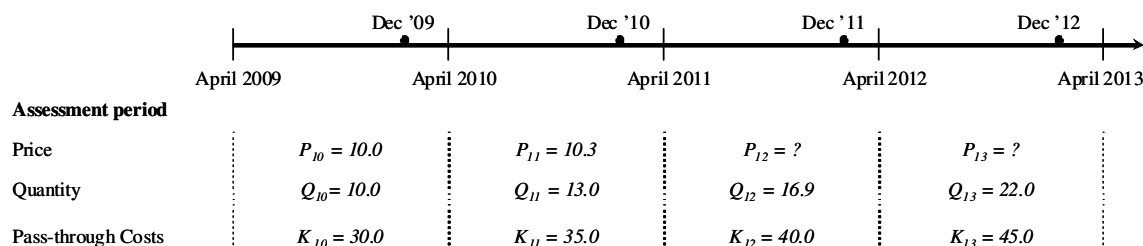
Quantity

- B8 As discussed in Chapter 4, the Commission proposes that a progressively updating base quantity will be used to calculate the notional revenue and allowable revenue formulae. Specifically, the Commission proposes that the values for the previous assessment period $Q_{i, t-1}$ be used as the base quantity.

³⁸⁹ Assessment period ending on 31 March 2011.

Worked Numerical Example – Lagged Quantity

B9 The timeline below depicts assessment periods (e.g., 1 April 2010 to 31 March 2011) and particular points in time, (e.g., December), when the EDB sets price for the forthcoming pricing year. The diagram illustrates the progression of periods referred to t and $t-1$ in the notional revenue and allowable revenue formulae.

Figure 1 Assessment Periods

where

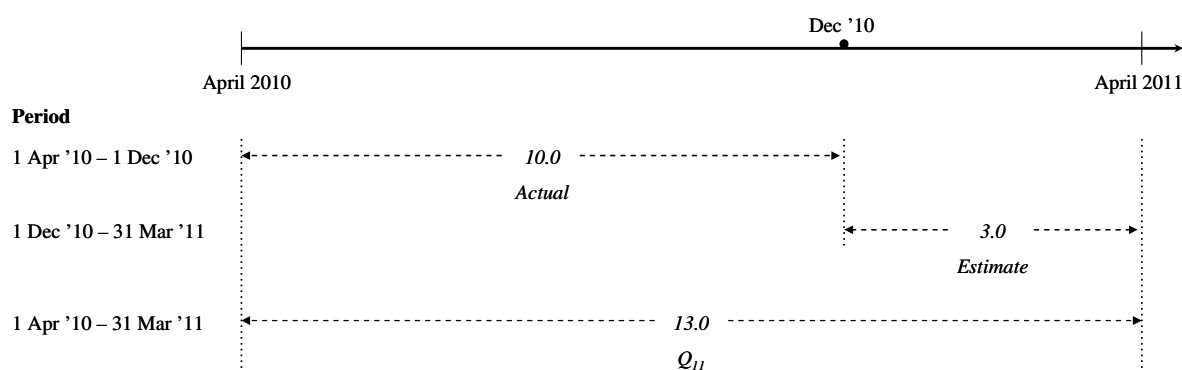
P_{10}, P_{11}, P_{12} are prices in the year to 31 March 2010, 2011, 2012 respectively;

Q_{10}, Q_{11}, Q_{12} are quantities in the year to 31 March 2010, 2011, 2012 respectively; and

K_{10}, K_{11}, K_{12} are the pass-through costs in the year to 31 March 2010, 2011, 2012 respectively.

Setting Price for Forthcoming Assessment Periods

B10 As prices for the forthcoming assessment period are set prior to the end of the current assessment period, it implies that the base quantities are not fully known and requires a degree of estimation (i.e., if prices are set on 1 December the EDB will have to estimate base quantities for 4 months). The Commission recognises that in implementing a $t-1$ approach, the base quantities will require a degree of estimation by EDBs.

Figure 2 Assessment Period Quantities

B11 Outlined below is a numeric example, using the values in the figures above, of a hypothetical EDB setting prices on 1 December 2010 (left column) and the subsequent assessment of the period in April 2012 (right column).

Price Set - 1 December 2010	Assessment – 31 March 2012
(1 April 2011 to 31 March 2012 (i.e, P ₁₂))	(1 April 2011 to 31 March 2012)
NR ₁₂ and R ₁₂ are the notional revenue and the allowable notional revenue for 2012 respectively.	$\frac{NR_{12}}{R_{12}} \leq 1$
$R_{12} = (P_{11}Q_{11} - K_{11}) \times (1 + \Delta CPI)(1 - X)$	$R_{12} = (P_{11}Q_{11} - K_{11}) \times (1 + \Delta CPI)(1 - X)$
say $(1 + \Delta CPI)(1 - X) = 1.05$	$R_{12} = (10.3 \times 13.0 - 35.0) \times 1.05$
$R_{12} = (10.3 \times 13.0 - 35.0) \times 1.05$	$R_{12} = 103.8$
$R_{12} = 103.8$	$NR_{12} = P_{12}Q_{11} - K_{12}$
as $NR_{12} = P_{12}Q_{11} - K_{12}$ and $\frac{NR_{12}}{R_{12}} \leq 1$	$NR_{12} = 11.06 \times 13.0 - 40.0$
this implies	$NR_{12} = 103.8$
$P_{12} \times 13.0 - 40.0 \leq 103.8$	$\frac{103.8}{103.8} \leq 1$, therefore, $\frac{NR_{12}}{R_{12}} \leq 1$
the price an EDB at most could charge is	
$P_{12} = \frac{103.8 + 40.0}{13.0} = 11.06$	

Worked Numerical Example – Impact of Under-estimation of Lagged Quantity

B12 As discussed in paragraph 4.42 the Commission considers that quantity misestimation may impact the assessment of the price-path. The numeric example illustrates the potential impact of an under-estimate of $Q_{i,t-1}$.

Price Set - 1 December 2010	Price Set - 1 December 2010
(1 April 2011 to 31 March 2012 (i.e, P ₁₂))	(1 April 2011 to 31 March 2012 (i.e, P ₁₂))
NR ₁₂ and R ₁₂ are the notional revenue and the allowable notional revenue for 2012 respectively.	
$R_{12} = (P_{11}Q_{11} - K_{11}) \times (1 + \Delta CPI)(1 - X)$	$R_{12} = (P_{11}Q_{11} - K_{11}) \times (1 + \Delta CPI)(1 - X)$
say $(1 + \Delta CPI)(1 - X) = 1.05$	say $(1 + \Delta CPI)(1 - X) = 1.05$ and $Q_{11} = 10.0$ (underestimate of 3.0)
$R_{12} = (10.3 \times 13.0 - 35.0) \times 1.05$	$R_{12} = (10.3 \times 10.0 - 35.0) \times 1.05$
$R_{12} = 103.8$	$R_{12} = 71.4$
as $NR_{12} = P_{12}Q_{11} - K_{12}$ and $\frac{NR_{12}}{R_{12}} \leq 1$	as $NR_{12} = P_{12}Q_{11} - K_{12}$ and $\frac{NR_{12}}{R_{12}} \leq 1$
this implies	this implies
$P_{12} \times 13.0 - 40.0 \leq 103.8$	$P_{12} \times 13.0 - 40.0 \leq 71.4$
the price a EDB at most could charge is	the price a EDB at most could charge is
$P_{12} = \frac{103.8 + 40.0}{13.0} = 11.06$	$P_{12} = \frac{71.4 + 40.0}{10.0} = 11.14$

Pass-through Costs

- B13 As discussed in Chapter 4 the Commission's draft decision is that it is appropriate to treat the following as pass-through costs:
- transmission charges;
 - local authority rates;
 - Commerce Act levies; and
 - Electricity Commission levies.
- B14 The Commission considers it appropriate that the Commerce Act levies, paid by EDBs during 2009/10, be amortised (e.g., straight-line amortisation over the regulatory period) and included as a pass-through cost (i.e., the 2009/10 Commerce Act levies will be apportioned evenly over five years and included in the appropriate *K* term).
- B15 Consistent with the approach under the Initial DPP compliance statement, under the Reset DPP, EDBs will have to disclose the total pass-through costs for the assessment period. For transparency the Commission proposes that as part of the compliance statement EDBs will be required to state separately the total 2009/10 Commerce Act levy paid / payable and the appropriate amortisation charge in the pass-through deduction for the assessment period.

Setting Price for Forthcoming Assessment Periods

- B16 The Commission understands that EDBs receive notification of transmission charges for the forthcoming year by no later than December each year and that these are fixed charges. These typically account for the largest portion of pass-through costs in any given year. This implies that at the time an EDB sets prices for the forthcoming year, for compliance purposes, there is a large degree of certainty regarding the pass-through costs that the EDB will face over that period. The Commission expects that EDBs will be aware of the forthcoming transmission charges and therefore can set prices accurately for the purpose of compliance.

Price Restructuring

- B17 The Commission's proposes that the price-path under the Reset DPP be based on the weighted average price of an EDBs services, and not to constrain prices for individual services, classes of services, or different customer groups. (i.e., the maximum allowable notional revenue only applies to the average price of specified services). In practice, under the Reset DPP the price-path will be assessed in terms of notional revenues, which are the annualised revenues that result from applying each set of prices to the corresponding set of lagged base quantities, net of pass-through costs and adjusted for inflation and the X-factor.
- B18 If an EDB has restructured its prices during an assessment period in terms of a quantity change (e.g., a change in the ratio of volume to capacity based charges), then the Commission proposes that, on assessment, an EDB will have to demonstrate that the new overall tariff structure is revenue neutral (i.e., all other things being equal, the price restructure did not create an increase in revenue for the business, above that which would have applied if the restructure had not occurred).

- B19 This implies for transparency purposes on the first assessment of the new pricing structure an EDB would be required to demonstrate compliance both under the new base quantity and previous base quantity tariff structures. Thereafter, as the base quantities on assessment are updated annually under the Reset DPP, the compliance statement will simply use the new tariff structure.

Change in Consumer Price Index

- B20 As discussed in Chapter 4, the Commission proposes to use a six-month lag to derive a CPI indexation term for the price-path. The September quarter index is generally published in October prior to price-setting/notification in December. The proposed formula to derive the applicable change in inflation is outlined below:

Formula 8 CPI Derivation Formula

$$\Delta CPI_t = \frac{CPI_{Dec,t-2} + CPI_{Mar,t-1} + CPI_{Jun,t-1} + CPI_{Sep,t-1}}{CPI_{Dec,t-3} + CPI_{Mar,t-2} + CPI_{Jun,t-2} + CPI_{Sep,t-2}} - 1$$

where:

ΔCPI_t is the deemed increase in CPI for the assessment period ending in year t

$CPI_{q,t}$ is the Consumer Price Index (“All groups Index SE9A” figure published by Statistics New Zealand) for the quarter q of the calendar year t

t refers to calendar years ending 31 December.

Worked Numerical Example – Lagged CPI

- B21 A six-month lagged CPI is to be used to derive the change in CPI under the price-path assessment formulae (i.e., ΔCPI) and as an input to the allowable notional revenue for the forthcoming year. An example of this for pricing year from 1 April 2010 to 31 March 2011 is as follows:

Indicative Calculation of ΔCPI based on formula 8 above

$$\Delta CPI_{10} = \frac{CPI_{Dec,08} + CPI_{Mar,09} + CPI_{Jun,09} + CPI_{Sep,09}}{CPI_{Dec,07} + CPI_{Mar,08} + CPI_{Jun,08} + CPI_{Sep,08}} - 1$$

Referencing Table 1 (overleaf) of the Consumer Price Index, and assuming $CPI_{Sep,09} = 1090^*$, implies:

$$\begin{aligned} \Delta CPI_{10} &= \frac{1072 + 1075 + 1081 + 1090}{1037 + 1044 + 1061 + 1077} - 1 \\ &= \frac{4321}{4219} - 1 \\ &= 0.024 \\ &= 2.4\% \end{aligned}$$

* $CPI_{Sep,09}$ was not published at the date of writing this report.

Figure 3 CPI Data Example

Table 1

Consumers Price Index
Tradables, non-tradables and all groups – index numbers and percentage changes⁽¹⁾⁽²⁾
Base: June 2006 quarter (=1000)

	Tradables ⁽³⁾⁽⁴⁾			Non-tradables ⁽⁵⁾			All groups ⁽³⁾		
	Index	Percentage change		Index	Percentage change		Index	Percentage change	
		From previous quarter	From same quarter of previous year		From previous quarter	From same quarter of previous year		From previous quarter	From same quarter of previous year
<i>Series ref: CPIQ</i>	<i>SE9NS6000</i>			<i>SE9NS6500</i>			<i>SE9A</i>		
Quarter									
2006 Mar	978	-0.1	2.1	990	1.0	4.1	985	0.6	3.3
Jun	1000	2.3	3.8	1000	1.0	4.1	1000	1.5	4.0
Sep	1003	0.3	3.0	1010	1.0	4.0	1007	0.7	3.5
Dec	990	-1.3	1.2	1018	0.8	3.8	1005	-0.2	2.6
2007 Mar	986	-0.4	0.9	1030	1.2	4.1	1010	0.5	2.5
Jun	995	0.9	-0.5	1041	1.1	4.1	1020	1.0	2.0
Sep	1000	0.5	-0.3	1047	0.6	3.7	1025	0.5	1.8
Dec	1018	1.8	2.8	1054	0.7	3.5	1037	1.2	3.2
2008 Mar	1020	0.2	3.4	1066	1.1	3.5	1044	0.7	3.4
Jun	1043	2.3	4.8	1076	0.9	3.4	1061	1.6	4.0
Sep	1063	1.9	6.3	1090	1.3	4.1	1077	1.5	5.1
Dec	1041	-2.1	2.3	1099	0.8	4.3	1072	-0.5	3.4
2009 Mar	1037	-0.4	1.7	1107	0.7	3.8	1075	0.3	3.0
Jun	1045	0.8	0.2	1112	0.5	3.3	1081	0.6	1.9

(1) Percentage changes are calculated from index numbers that are not rounded until the June 2006 quarter.
(2) Five decimal places have been retained prior to the June 2006 quarter to preserve percentage changes that were originally published on earlier expression bases.
(3) From the September 2006 quarter, prices for fresh fruit and vegetables are not seasonally adjusted. They were seasonally adjusted until the June 2006 quarter.
(4) Tradables are goods and services that are imported or that are in competition with foreign goods and services either in domestic or foreign markets.
(5) Non-tradables are goods and services that do not face foreign competition.

Source: Statistics New Zealand, June 2009

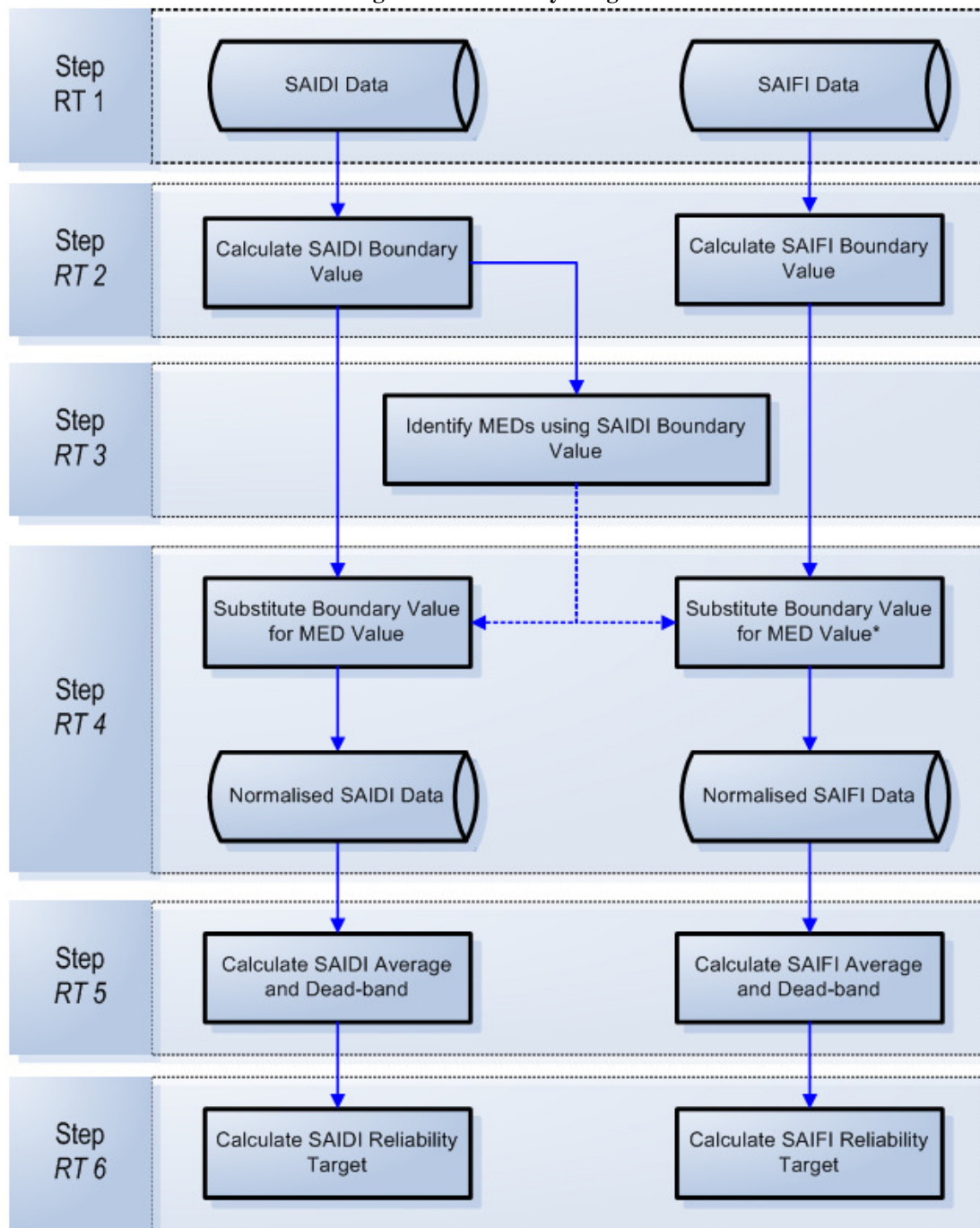
APPENDIX C: QUALITY STANDARDS

C1 This appendix sets out further details on the Commission’s proposed quality standards. It includes process descriptions with associated steps and illustrations of the multi-year assessment process.

Process for Calculating Reliability Target

C2 The diagram below (Figure 4) depicts the steps an EDB should take to calculate its Reliability Targets for the Reset DPP. These steps are set out in detail in the following section.

Figure 4 Reliability Target Process



* SAIFI substitution is subject to MED value > SAIFI Boundary Value

Steps Used to Calculate Reliability Targets

C3 The diagram above depicts two parallel processes that involve a number of activities (as discussed in Chapter 7). These are set out in further detail below:

- assemble SAIDI and SAIFI datasets;
- calculate SAIDI and SAIFI boundary values;
- identify the Reference Period MEDs;
- substitute MED values with boundary values;
- assemble the Normalised Reference Dataset; and
- calculate SAIDI and SAIFI Reliability Targets.

Step RT1 Assemble Reference Dataset

- | |
|---|
| <p>a Prepare a Reference Dataset, comprising the daily SAIDI and SAIFI values for the five year period 1 April 2004 to 31 March 2009.³⁹⁰</p> |
|---|

Step RT2 Calculate the SAIDI and SAIFI boundary values

- | |
|--|
| <p>a Using only those days where the daily SAIDI value > 0 (i.e., exclude zero-SAIDI days) calculate the SAIDI boundary value³⁹¹ (B_{SAIDI}) and the SAIFI boundary value (B_{SAIFI}), as follows:</p> <p>b Calculate the natural logarithm (\ln) of each daily SAIDI value.</p> <p>c Calculate α_{SAIDI}, the average of the logarithms of the dataset.</p> <p>d Calculate β_{SAIDI}, the standard deviation of the logarithms of the dataset.</p> <p>e B_{SAIDI} is then calculated as follows:</p> $B_{SAIDI} = e^{(\alpha_{SAIDI} + 2.5\beta_{SAIDI})}$ <p>f Repeat steps b to d to calculate B_{SAIFI} using SAIFI data calculate α_{SAIFI} and β_{SAIFI}.</p> |
|--|

³⁹⁰ Values in the Reference and Assessment Datasets are for Class B and Class C interruptions (i.e., respectively, interruptions planned by the EDB and unplanned interruptions). An interruption relates to the conveyance of electricity to a customer by means of an electricity line and means the cessation of supply to that customer for a period of 1 minute or longer.

³⁹¹ B_{SAIDI} is equivalent to T_{MED} in the IEEE Standard.

Step RT3 *Identify Major Events Days*

- a Identify days with daily SAIDI values greater than B_{SAIDI} . These are to be the MEDs in both the SAIDI and SAIFI datasets.

Step RT4 *Prepare the normalised Reference Dataset*

- a In the SAIDI dataset, replace the daily SAIDI values of MEDs with B_{SAIDI} .
- b In the SAIFI dataset, replace the daily SAIFI values of MEDs with B_{SAIFI} if the daily SAIFI value exceeds B_{SAIFI} .

Step RT5 *Calculate the SAIDI and SAIFI Dead-bands*

- a Calculate the average annual SAIDI and SAIFI values in the Normalised Reference Dataset

$$\mu_{SAIDI} = \frac{\text{Sum of 5 years of daily SAIDI values}}{5}$$

$$\mu_{SAIFI} = \frac{\text{Sum of 5 years of daily SAIFI values}}{5}$$

- b Calculate the SAIDI and SAIFI dead-bands (equal to a single standard deviation of the annual values for the Normalised Reference Dataset)

$$\sigma_{SAIDI} = \text{Standard Deviation of 5 years of daily SAIDI values} \times \sqrt{365}$$

$$\sigma_{SAIFI} = \text{Standard Deviation of 5 years of daily SAIFI values} \times \sqrt{365}$$

Step RT6 *Calculate the SAIDI and SAIFI Reliability Targets*

- a Calculate the SAIDI and SAIFI Reliability Targets (being the annual average plus the dead-band) as follows:

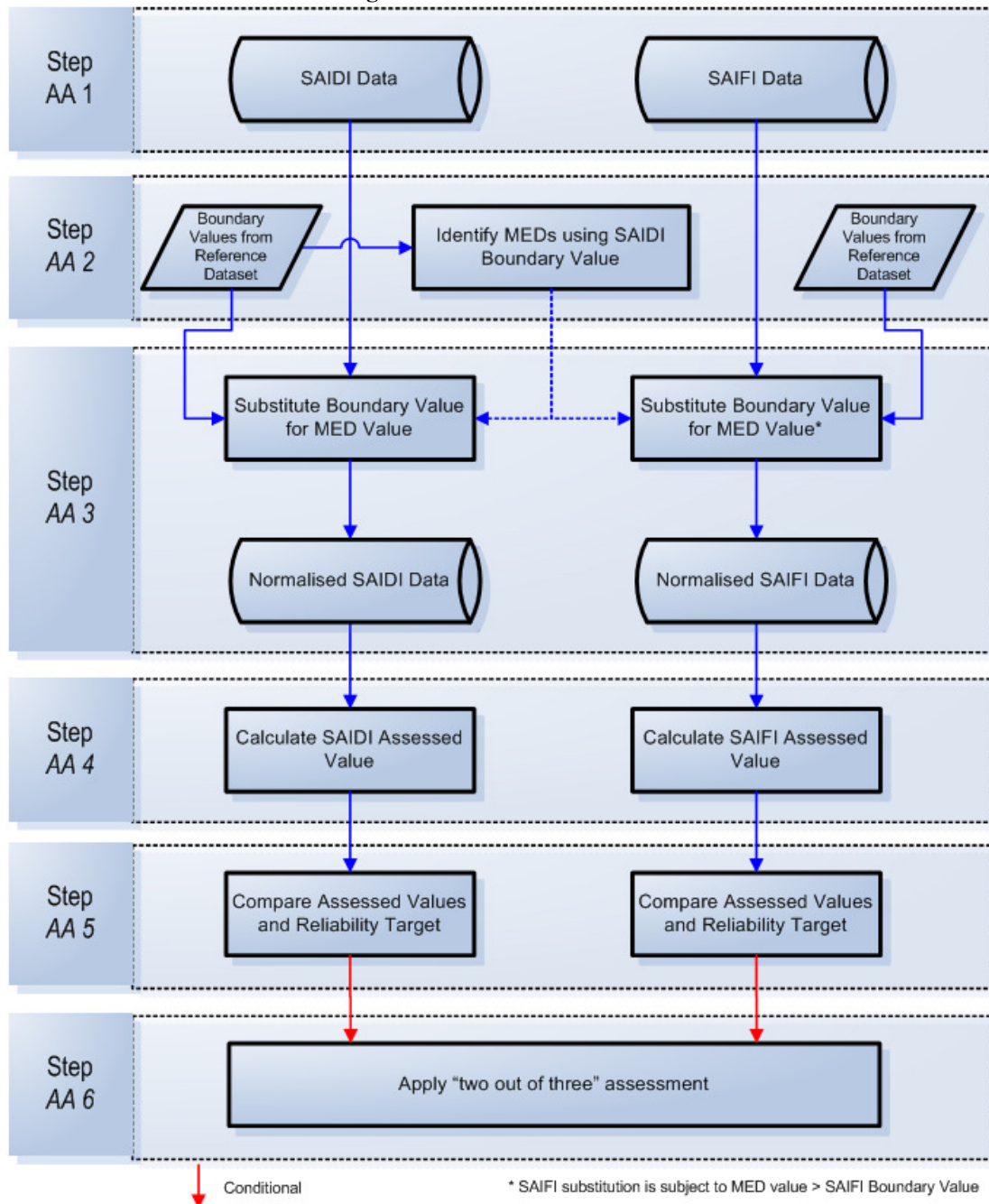
$$SAIDI_{TARGET} = \mu_{SAIDI} + \sigma_{SAIDI}$$

$$SAIFI_{TARGET} = \mu_{SAIFI} + \sigma_{SAIFI}$$

Assessment Against Reliability Targets

C4 The diagram below (Figure 5) depicts the annual process to be undertaken by an EDB to assess its compliance with the quality-path. Firstly, it should calculate its *Assessed Values*. These Assessed Values are then to be compared with the EDB’s respective *Reliability Targets*. If required, the EDB should then assess its performance using the “two out of three” process. These steps are set out in detail in the following section.

Figure 5 Annual Assessment Process



Steps Used to Assess Annual Performance

C5 The diagram above depicts the annual process to assess compliance with the quality-path. The steps involved are set out below (as discussed in Chapter 7). These are discussed in further detail below:

- assemble SAIDI and SAIFI datasets;
- identify the Assessment Period MEDs;
- substitute MED values with boundary values;
- assemble Normalised Assessment Dataset;
- calculate SAIDI and SAIFI Assessed Values;
- compare Assessed Values with respective Reliability Targets; and
- potentially apply “two out of three” rule.

Step AA1 Assemble Assessment Dataset for the Assessment Period (y)

- a Prepare the *Assessment Dataset* comprising the daily SAIDI and SAIFI values for the period 1 April to 31 March (inclusive) ending in the year y.

Step AA2 Identify Major Events Days

- a Identify days in the Assessment Dataset with daily SAIDI value greater than B_{SAIDI} (defined using the Reference Dataset in Step RT2). These are to be the MEDs for both the SAIDI and SAIFI Assessment Dataset for year y.

Step AA3 Prepare the Normalised Assessment Dataset

- a In the SAIDI dataset, replace the daily SAIDI values of MEDs with B_{SAIDI} (defined using the Reference Dataset).
- b In the SAIFI dataset, replace the daily SAIFI values of MEDs with B_{SAIFI} (defined using the Reference Dataset) if the daily SAIFI value exceeds B_{SAIFI} .

Step AA4 Calculate the Assessed Values

- a The Assessed Values for year y are defined as follows:
- $$SAIDI_{ASSESS_y} = \text{sum of daily SAIDI values in the Normalised Assessment Dataset for year } y$$
- $$SAIFI_{ASSESS_y} = \text{sum of daily SAIFI values in the Normalised Assessment Dataset for year } y$$
- Where $y = 2011, 2012, 2013, \text{ etc...}$

Step AA5 *Compare the Assessed Values with the Reliability Targets*

- a Determine whether the Assessed Values for year y exceed their respective Reliability Targets, specifically whether:

$$SAIDI_{ASSESS_y} > SAIDI_{TARGET}$$

or

$$SAIFI_{ASSESS_y} > SAIFI_{TARGET}$$

- b If neither of the Assessed Values exceed their respective Reliability Targets, an EDB will be in compliance in year y , otherwise the multi-year assessment in Step AA6 applies.

Step AA6 *Apply “two out of three” Assessment*

- a If the Assessed Values in both of the previous two extant assessment periods ($y-1$, $y-2$) did not exceed their respective Reliability Targets, an EDB will be in compliance in year Y . Otherwise the EDB is in breach of the quality-path.³⁹²

³⁹² For the avoidance of doubt: During the Reset DPP, if there are no previous assessment periods (as will be the case in 2011) the EDB is in compliance. During 2012, when there will have been only one previous assessment period the EDB is in compliance unless the Assessed Values for the 2011 assessment period also exceeded the Reliability Targets.

Illustration of the Multi-year Assessment Process

C6 Figure 6 shows six examples of how the “two out of three” assessment process would affect hypothetical sequences of performance. A cross depicts a year in which an EDB’s performance in either SAIDI or SAIFI exceeds the SAIDI or SAIFI Reliability Target respectively. A tick depicts a year in which an EDB’s performance in both SAIDI and SAIFI Assessed Values were less than or equal to its respective Reliability Targets.

Figure 6 “Two out of three” Assessment Example

	2011	2012	2013	2014	2015	
EDB 1	X	✓	X	✓	✓	Breach in year 3
EDB 2	X	✓	✓	X	X	Breach in year 5
EDB 3	✓	X	✓	X	✓	Breach in year 4
EDB 4	X	X	X	✓	✓	Breaches in years 2 & 3
EDB 5	X	X	✓	X	✓	Breaches in years 2 & 4
EDB 6	✓	X	✓	✓	X	No breach in period

X indicates a year in which EDB *does not* comply with reliability target.

✓ indicates a year in which EDB *complies with* its reliability target.

X indicates a year in which EDB *breaches* its quality-path.

C7 As a further illustration we examine the performance of EDB 5. Using the flowchart below, its hypothetical performance under the “two out of three” assessment process in the regulatory period is derived as follows:

- year 2011, no breach possible;
- year 2012, decision route is *No, No, Yes, No*: indicating a breach
- year 2013, decision route is *No, Yes*: indicating compliance;
- year 2014, decision route is *No, No, No, No*: indicating a breach; and
- year 2015, decision route is *No, Yes*: indicating compliance.

Figure 7 “Two out of three” Assessment Flow Chart

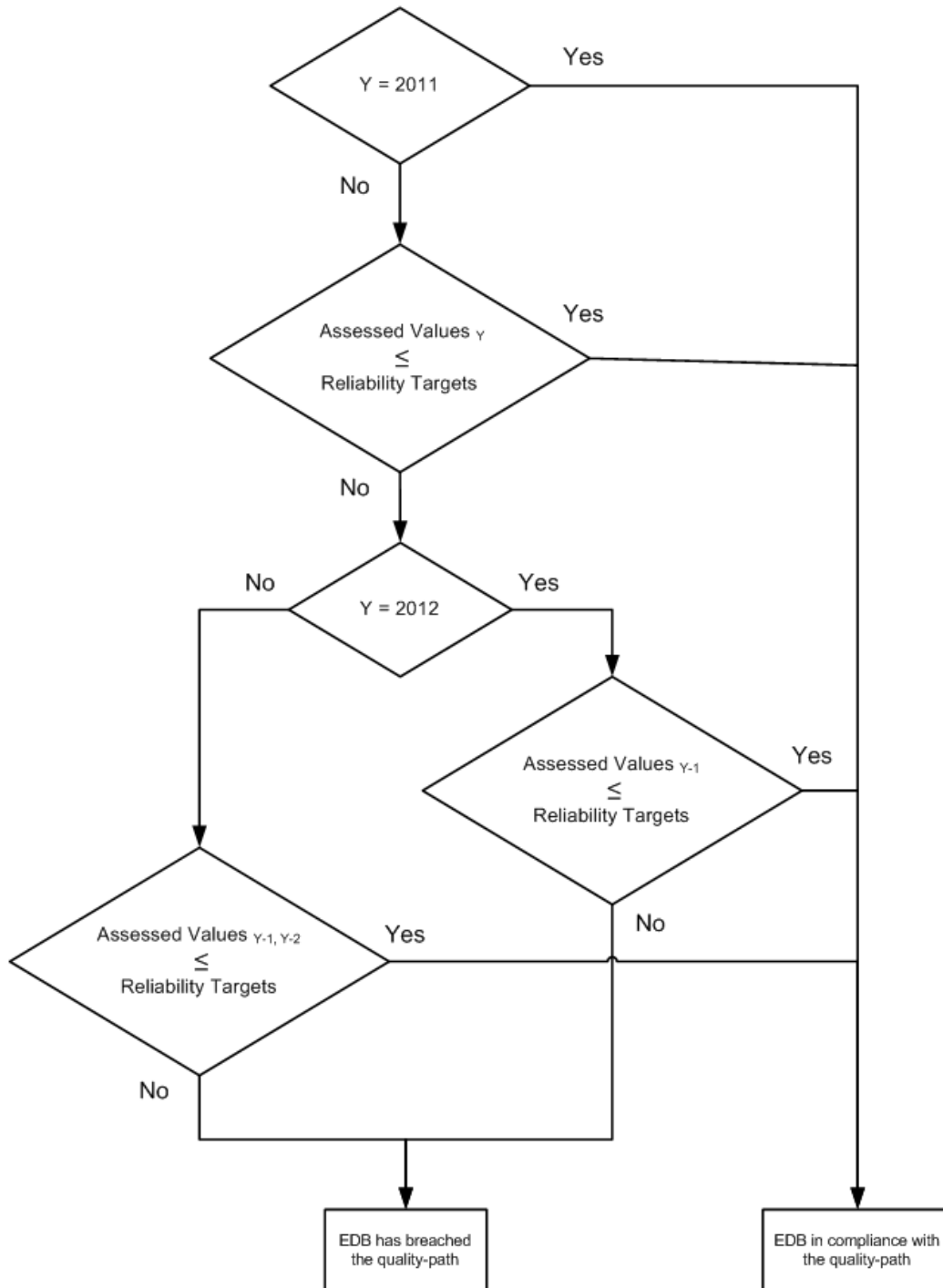


Illustration of Proposed Overall Assessment Methodology

C8 As discussed in Chapter 7, the proposed quality standards under the Reset DPP are designed to reduce the impact of normal variability in the SAIDI and SAIFI performance indices. There are two mechanisms proposed to achieve this:

- the use of dead-bands for calculating the Reliability Targets; and
- the multi-year compliance assessment procedure.

Historic Breaches

C9 Table 6 includes estimates of the number of SAIDI breaches that would have occurred in previous assessment periods for differing dead-band widths (ranging from 0 to 1.3 standard deviations) and different compliance assessment procedures. The estimate has been derived using historic SAIDI data provided to the Commission by the 23 networks not included in the Indicative List of Consumer-owned EDBs.³⁹³ The analysis used is limited by the number of years of data available, and as a result each assessment period lies within the reference period.

C10 However, the Commission considers that the comparison between the Thresholds methodology (first column in **red**) and the proposed method (second to last column in **blue**) illustrates the likely impact of the proposed scheme. The combination of a one (1) standard deviation dead-band and a “two out of three” assessment procedure significantly reduces the number of breaches observed. The Commission also notes that, although it provides a more stringent test than the two in a row method, the “two out of three” would have resulted in only a single additional SAIDI breach.³⁹⁴

Table 6 Impact of Various Assessment Mechanisms on SAIDI Breaches

Assessment	Single year				Two in a row				Two out of three			
	0	0.8	1	1.3	0	0.8	1	1.3	0	0.8	1	1.3
Breaches in 2003-04	12	10	9	7	7	4	4	3	7	4	4	3
Breaches in 2004-05	7	3	2	1	3	0	0	0	5	0	0	0
Breaches in 2005-06	7	2	1	0	2	0	0	0	4	1	1	0
Breaches in 2006-07	9	5	4	4	4	0	0	0	4	0	0	0
Breaches in 2007-08	10	8	7	4	5	3	3	1	6	4	3	1
Total Breaches	45	28	23	15	21	7	7	4	26	9	8	4

³⁹³ Commerce Commission, *Proposed Approach to Consumer-Owned Electricity Distribution Businesses Under The Initial Default Price-Quality Path Consultation Paper*, 16 March 2009.

³⁹⁴ The results in the table have been derived using the daily SAIDI values and an estimated boundary value. The historic data indicates that on some days SAIFI may exceed the Reliability Targets independently of SAIDI; preliminary results suggest that this has the effect of increasing the total number of breaches from 45 to 59 and from 8 to 11 in the red and blue columns respectively.

Rates of ‘False Positives’

- C11 Table 7 shows a rough estimate of the number of SAIDI breaches that might be expected solely as a result of normal statistical variability. The estimate assumes that a random sample of annual SAIDI values would exhibit a normal probability distribution.³⁹⁵ In the single year assessment approach, a SAIDI breach occurs if the SAIDI value exceeds the average SAIDI. Under the single year assessment approach, with no dead-band an expected 50% of networks (i.e., 10.5 networks) would breach in each year. A one standard deviation dead-band reduces this to 15.9% of networks (3.3 networks).³⁹⁶
- C12 For the multi-year approaches, the analysis assumes that the probability that the assessed value will exceed the reliability target remains the same in each year.

Table 7 Statistical Estimate using Assessment Mechanisms

Assessment	Single year				Two in a row				Two out of three			
	0	0.8	1	1.3	0	0.8	1	1.3	0	0.8	1	1.3
Standard Deviation	0	0.8	1	1.3	0	0.8	1	1.3	0	0.8	1	1.3
Breaches in year 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Breaches in year 2	11.5	4.9	3.6	2.2	5.8	1.0	0.6	0.2	5.8	1.0	0.6	0.2
Breaches in years 3–5	11.5	4.9	3.6	2.2	5.8	1.0	0.6	0.2	8.6	1.8	1.1	0.4
Total over 5 years	46.0	19.6	14.4	8.8	23.2	4.0	2.4	0.8	31.6	6.4	3.9	1.4

- C13 In year 1, no quality breaches can occur as the reliability target will have not been exceeded in a previous assessment year. In year two, in both the two in a row and the two out of three approaches, a breach occurs only if the assessed value exceeds the reliability target in both years (fail-fail). The probability is calculated by multiplying the annual probabilities together. The probability of this occurring in two years, with a one standard deviation dead-band, is 15.9% x 15.9% = 2.5% (an expected 0.6 networks). For years three and beyond, there are three sequences in which a “two out of three” breach can occur: (fail-fail-fail, fail-pass-fail, and pass-fail-fail). The probability of this occurring with a one standard deviation dead-band is 15.9% x 15.9% x 15.9% + 15.9% x 84.1% x 15.9% + 84.1% x 15.9% x 15.9% = 4.6% (an expected 1.1 networks).

³⁹⁵ The Central Limits Theorem states that, under certain conditions, the sum of a sufficiently large number of random variables is approximately normally distributed. The assumption of “normal statistical variability” in the analysis implies a probability distribution of annual SAIDI values notionally derived by summing a large number (365) of independent daily values. Daily SAIDI values exhibit an approximately log-normal probability distribution. The validity of this assumption has not been tested and the Commission notes that the log-normal approximation may not be wholly appropriate for all EDBs as discussed in Chapter 7.

³⁹⁶ Standard distribution tables give the probability of a normally distributed observation being less than one standard deviation above the mean as 84.1%. The probability that it will be larger is 100%–84.1% = 15.9%.

- C14 During the regulatory period, the total number of SAIDI breaches resulting from statistical variability under the proposed approach (“two out of three” assessment with a one standard deviation dead-band) is expected to be: zero in year 1; 0.6 in year 2; and 1.1 in each of years 3–5, totalling 3.9 breaches over 5 years. These statistically-based five-year estimates are roughly comparable with the corresponding results based on the historic data.