

COMMERCE COMMISSION

Regulation of Electricity Lines Businesses

Targeted Control Regime

Threshold Decisions

(Regulatory Period Beginning 2004)

1 April 2004



COMMERCE COMMISSION

CONTENTS

	Page
Executive Summary	1
Introduction	8
Purpose and Scope	8
Implementing the Targeted Control Regime	9
Setting the Thresholds to Apply from 2004	10
The Thresholds	14
Thresholds for Distribution Businesses	14
Thresholds for Transpower	16
Threshold Assessments	18
Threshold Assessment Process	18
Price Path Threshold	19
Quality Threshold	23
Conceptual Approach	27
Rationale for the Price Path and Quality Thresholds	27
Implementing the CPI-X Price Path Threshold	30
Determining the X Factors	31
Transpower's Price Path Threshold	36
Threshold Options Not Implemented	37
Industry-Wide Performance (B Factors)	41
Methodology for Determining the B Factors	41
Analysis of Overall Distribution Business Productivity	46
Analysis of Transpower's Productivity	53
Decisions on the B Factors	54
Relative Distribution Business Performance (C Factors)	55
Methodology for Determining the C Factors	55
Analysis of Relative Distribution Business Productivity	57
Analysis of Relative Distribution Business Profitability	59
Decisions on the C Factors	62
Appendix 1: X Factors for Lines Businesses	63
Appendix 2: Glossary	64

EXECUTIVE SUMMARY

This paper sets out and explains the Commerce Commission's (Commission's) final decisions on the thresholds to apply to large electricity lines businesses (lines businesses) under Part 4A of the Commerce Act, for the regulatory period beginning in 2004.

This paper was previously issued by the Commission on 23 December 2003. At that time, the Commission indicated that the paper would be re-issued along with the finalised Notice published in the *New Zealand Gazette* used to set the thresholds, updated to reflect any changes in technical detail. Subsequently, the Commission decided to publish the thresholds for distribution businesses and Transpower in two separate *Gazette* Notices, given that the start dates and lengths of the regulatory periods are different for Transpower than for other lines businesses.

On 11 February 2004, the Commission issued drafts of two *Gazette* Notices—namely the *Commerce Act (Electricity Distribution Thresholds) Notice 2004* and the *Commerce Act (Transpower Thresholds) Notice 2004*—and invited written submissions from interested parties on the technical details of the drafts, to ensure that the Notices give effect to the Commission's threshold decisions. Submissions were due by 1 March 2004.

Following revisions to take into account these submissions on the drafts, the *Commerce Act (Electricity Distribution Thresholds) Notice 2004* was published in the *Gazette* on 31 March 2004. This paper updates the paper of 23 December 2003 to reflect these revisions, and to provide clarifications where the Commission considered necessary. The Commission will publish the *Commerce Act (Transpower Thresholds) Notice 2004* in the *Gazette* by 30 June 2004.

The Thresholds

Under subpart 1 of Part 4A, the Commission is required to set thresholds for the declaration of control in relation to lines businesses (distribution businesses and Transpower). The thresholds are, in effect, a screening mechanism to identify lines businesses whose performance may warrant further examination through a post-breach inquiry and, if required, control by the Commission.

After consulting with interested parties, the Commission has decided to set two thresholds for the regulatory period beginning in 2004 (i.e. 1 April 2004 for distribution businesses and 1 July 2004 for Transpower): a price path threshold, of the form CPI-X; and a quality threshold. The thresholds are of the same form as the thresholds set by the Commission on 6 June 2003, applying until 31 March 2004 for distribution businesses and 30 June 2004 for Transpower. However, new criteria and X factors apply.

A lines business will breach the price path threshold if its average price changes at an annual rate exceeding the change in the CPI (consumer price index), less the annual rate of X% that is set by the Commission for that business.

To demonstrate compliance with the quality threshold, a lines business must satisfy:

- a reliability criterion, requiring no material deterioration in quality, which will be assessed on an annual basis; and
- a consumer engagement criterion, requiring that the business has meaningfully engaged with consumers to determine their demand for service quality, which will be assessed at least once every two years.

Distribution businesses will be assessed against the thresholds over a regulatory period of five years, beginning on 1 April 2004. In Transpower's case, its thresholds will apply for a one year period only, beginning on 1 July 2004.

The Purpose of the Thresholds

The purpose of the price path threshold is to provide incentives for lines businesses to:

- improve efficiency;
- share the benefits of efficiency gains with consumers over the long term, including through lower prices (in real terms); and
- be limited in their ability to extract excessive profits.

The purpose of the quality threshold is to provide incentives for lines businesses to:

- not allow their reliability to fall as a means of reducing costs in response to the price path threshold; and
- supply electricity distribution and transmission services at a quality demanded by consumers.

Setting both a price path threshold and a quality threshold acknowledges that there is a trade-off between the price and quality of lines services. In making its decisions, the Commission has given careful consideration to ensuring that lines businesses will still retain incentives to invest in their networks and to maintain quality of service, including reliability of supply.

In combination, the two thresholds are consistent with a targeted control regime for the long-term benefit of consumers and consistent with the specific outcomes sought in the Purpose Statement of subpart 1 of Part 4A of the Act.

Approach to Determining the X Factors of the Price Path Threshold

For distribution businesses, the Commission has used a comparative approach to setting the X factors in the CPI-X price path threshold. Each X factor is the sum of:

- a *B factor*, reflecting expected industry-wide improvements in efficiency, determined through total factor productivity (TFP) analysis; and
- a *C factor*, reflecting the relative performance of groups of distribution businesses, and found from the sum of two component factors:

- a relative productivity component (C_1 factor), determined through multilateral total factor productivity (MTFP) analysis; and
- a relative profitability component (C_2 factor), determined by comparing 'residual' rates of return.

Applying a comparative approach to setting Transpower's price path would require international benchmarking. The Commission considers that there is currently insufficient information on which to establish a robust comparative approach to assessing Transpower's performance, and therefore only a B factor has been set for Transpower. Consequently, Transpower's X factor is equal to its B factor.

Consultation and Expert Advice

In evaluating the conceptual approach to setting the parameters of the price path threshold, and the appropriate methodologies for evaluating the B and C factors, the Commission has considered information and analysis from a range of sources, has given full consideration to submissions from interested parties, and has received the advice of external experts.

In particular, the Commission has drawn on the methodologies, analyses and conclusions presented in two reports prepared for the Commission by Meyrick and Associates (Meyrick). Meyrick performed analyses of industry-wide transmission and distribution business performance relevant to setting a B factor, as well as analyses of relative distribution business performance relevant to setting the C factors.

Meyrick's first report (Initial Report) was titled *Regulation of Electricity Lines Businesses, Resetting the Price Path Threshold – Comparative Option*, and utilised lines business information disclosure data from 1996 to 2002. Meyrick's Initial Report was issued for consultation as part of the Commission's draft decisions of 5 September 2003 on the thresholds to apply from 2004.

Interested parties had the opportunity to make submissions on the draft decisions and Meyrick's Initial Report, to present their submissions at a conference held by the Commission from 3-6 November 2003, and to make cross submissions following the conference, in response to issues raised by the Commission or other interested parties. In coming to its final decisions, issued on 23 December 2003, the Commission gave full consideration to the views of interested parties on Commission documents and Meyrick's Initial Report.

Meyrick's second report (Final Report) is titled *Regulation of Electricity Lines Businesses, Analysis of Lines Business Performance (1996-2003)*, and was released by the Commission along with the 23 December 2003 version of this paper. Meyrick's Final Report is based on an updated analysis that takes into account the 2003 information disclosure data and addresses the issues raised by interested parties on the initial analysis.

Industry-Wide Distribution Business Productivity (B Factor)

The Commission's decisions on the B factor applying to distribution businesses have been informed by Meyrick's total factor productivity (TFP) analysis of relevant information disclosure data from 1996-2003. The TFP analysis indicates that aggregate distribution TFP since 1996 has increased at a trend annual rate of around 2.1%. This result explicitly corrects for discontinuities in the disclosure data series and one-off events that may distort the estimate of distribution TFP, in particular, the effects of the Auckland CBD outage, the ownership separation of lines and retail businesses, and the concurrent change in information disclosure regulations.

For the regulatory period beginning in 2004, the Commission considers it prudent to make no adjustment to the B factor for any input price differential between the distribution industry and the economy, given that some uncertainty arises from the inconsistent evidence on labour and capital input prices. However, during the regulatory period, the Commission intends to examine ways in which relevant input prices can be monitored with greater confidence. Therefore, adjusting distribution TFP for economy-wide TFP growth, estimated at 1.1%, but not adjusting for any difference in input prices between the industry and the economy, results in a B factor for all distribution businesses of 1%.

Relative Distribution Business Productivity (C₁ Factors)

The Commission has used a two stage comparative analysis to derive the C factors, focusing on relative productivity and relative profitability in turn. The first stage C factor analysis involved determining relative distribution business productivity using multilateral total factor productivity (MTFP) analysis on relevant information disclosure data.

MTFP analysis is an extension of the TFP index approach that the Commission has used for deriving the B factor, and allows comparisons both of productivity growth rates and the absolute levels of productivity. It is possible to incorporate aspects of density-related operating environment conditions (such as customer density and energy density) into the MTFP analysis directly, in a similar manner to the way density can be taken into account in multiple output econometric cost functions.

A shorter period of data has been used, from 1999 to 2003, because analyses of relative distribution business performance are more sensitive than analyses of aggregate business performance to any inconsistencies in the disclosure data. Also, TFP analysis, which focuses on productivity growth rates based on trends, requires a longer data series than MTFP analysis, which focuses on productivity levels.

Distribution businesses have been ranked on the basis of their average MTFP index values from 1999 to 2003, and grouped into above-average performers, average performers, and below-average performers, taking account of any clear step points that occur in the rankings. Below-average performers have been assigned a C₁ factor of +1%. Businesses performing near the industry average in terms of their relative cost efficiencies have received a C₁ factor of zero. Businesses with relatively higher productivity have been assigned a C₁ factor of -1%.

While the common B factor will place incentives on distribution businesses so that average industry productivity improves over the regulatory period, the C_1 factor aims to bring distribution businesses with relatively lower productivity in line with this improving average over two regulatory periods. A ten-year time frame has been used to derive the magnitude of the C_1 factor, because the Commission acknowledges that rapid improvements in efficiency for infrastructure industries may be difficult to achieve. Attempting to significantly improve productivity in the short term could potentially harm consumers in the long run. On the other hand, better performing businesses will still face incentives to make efficiency improvements each year to avoid breaching the price path threshold. These businesses will be able to retain relatively more of the benefits of any efficiency gains that they can make over the regulatory period.

Relative Distribution Business Profitability (C_2 Factors)

The second stage C factor analysis ranked distribution businesses by their average profitability from 2000-2003, measured by calculating post-tax 'residual' rates of return, and then allocated the businesses to three groups. Those businesses that have been setting comparatively low prices, resulting in relatively lower profitability, have been assigned a C_2 factor of -1%. Businesses with comparatively high prices, or achieving relatively high rates of return, have been set a positive C_2 factor of +1%. All other businesses have received a C_2 factor of zero.

The C_2 factor acknowledges that, while some businesses have more scope to reduce prices and to share the benefits of efficiency gains with consumers over the long term, other businesses have been consistently maintaining low prices, relative to costs. Adjustments to the C factor have been applied to ensure that excessive profits are constrained, but not to an extent that might discourage future efficiency gains or investment. Conversely, assigning a negative C_2 factor to those businesses that have typically been achieving low returns is consistent with the long-term benefit of consumers as it ensures those businesses also retain the ability to invest in their networks.

Overall X Factors

The X factor for each distribution business has been found by summing the common B factor of 1%, with a composite C factor that combines the productivity (C_1) and profitability (C_2) component factors described above. Following the analysis of relative distribution business performance, no business was found to exhibit both relatively lower productivity and relatively higher returns. However, a small number of businesses have been found to exhibit both relatively higher productivity and relatively lower returns. Therefore, these businesses have a combined C factor of -2%. Allowing the factors to be combined acknowledges that the thresholds should not constrain more productive businesses, with below-average returns, from bringing their average prices up to more efficient and sustainable levels. All other distribution businesses have combined C factors of -1%, 0% or 1%.

The overall X factors for distribution businesses therefore range from -1% to +2%, and are presented in Table 1 on the next page, along with the component B and C factors. The level of the overall X factors recognises concerns regarding the quality of the underlying disclosure data, and is consistent with the principle that the CPI-X price path acts as a threshold, rather than a form of control. On the other hand, the Commission

does not expect that those distribution businesses striving to attain best practice in the provision of distribution services will consider themselves limited to the efficiency gains implied by the X factors assigned to them under the price path threshold.

Thresholds for Transpower

Given the uncertainties associated with the approach the Electricity Commission will take with respect to Transpower's investment programme, the Commission considers it prudent to reset Transpower's price path and quality thresholds for only one year. A one year price path threshold will continue to place incentives on Transpower to improve efficiencies, through the imposition of a positive X factor, but will not lock in a price path that, over a five-year period, might become inconsistent with decisions made concerning Transpower's investment programme.

The Commission considers that the TFP analysis of Transpower's performance, which could only be based on data from 1999, does not cover a sufficiently long period to be useful in deciding on an appropriate B factor. Given that Transpower's price path threshold is only being set for one year, and the lack of strong evidence to the contrary, the Commission considers it appropriate to set Transpower's B factor to be the same as that for distribution businesses. Transpower's overall X factor will therefore be 1%. However, in setting Transpower's thresholds to apply from 1 July 2005, the Commission may consider it appropriate to set a different X factor for Transpower.

Over the next 12 months, the Commission will consider the appropriate implementation of the targeted control regime for Transpower, in light of decisions made regarding Transpower's investment programme, and in consultation with interested parties.

Table 1 – X Factors for Lines Businesses (Regulatory Period Beginning in 2004)

Lines Business	X (=B+C)	B	C (=C₁+C₂)	C₁	C₂
Centralines	2%	1%	1%	0%	1%
Counties Power	2%	1%	1%	0%	1%
Eastland Network	2%	1%	1%	1%	0%
Electra	2%	1%	1%	0%	1%
MainPower	2%	1%	1%	1%	0%
Marlborough Lines	2%	1%	1%	1%	0%
Powerco	2%	1%	1%	0%	1%
The Lines Company	2%	1%	1%	0%	1%
WEL Networks	2%	1%	1%	0%	1%
Alpine Energy	1%	1%	0%	0%	0%
Aurora Energy	1%	1%	0%	1%	-1%
Buller Electricity	1%	1%	0%	1%	-1%
Electricity Ashburton	1%	1%	0%	1%	-1%
Horizon Energy	1%	1%	0%	-1%	1%
Nelson Electricity	1%	1%	0%	-1%	1%
Network Tasman	1%	1%	0%	-1%	1%
Orion	1%	1%	0%	0%	0%
<i>Transpower</i>	1%	1%	N/A	N/A	N/A
Westpower	1%	1%	0%	1%	-1%
Electricity Invercargill	0%	1%	-1%	-1%	0%
Network Waitaki	0%	1%	-1%	0%	-1%
Scanpower	0%	1%	-1%	-1%	0%
The Power Company	0%	1%	-1%	0%	-1%
Top Energy	0%	1%	-1%	0%	-1%
Unison Networks	0%	1%	-1%	0%	-1%
Vector	0%	1%	-1%	-1%	0%
Northpower	-1%	1%	-2%	-1%	-1%
OtagoNet	-1%	1%	-2%	-1%	-1%
Waipa Networks	-1%	1%	-2%	-1%	-1%

INTRODUCTION

Purpose and Scope

- 1 Part 4A of the Commerce Act (the Act) came into effect on 8 August 2001. Part 4A contains provisions relating to a regulatory regime for large electricity lines businesses (lines businesses) implemented by the Commission, including:
 - a *targeted control regime*, relating to goods and services supplied by lines businesses (i.e. distribution businesses and Transpower), in subpart 1 of Part 4A; and
 - an *information disclosure regime*, relating to the operation and behaviour of lines businesses, in subpart 3 of Part 4A.
- 2 This paper sets out and explains the Commission's final decisions on the thresholds for the declaration of control of goods or services supplied by lines businesses, under subpart 1 of Part 4A. The thresholds will apply to distribution businesses for a five-year regulatory period beginning on 1 April 2004, and to Transpower for a one year regulatory period beginning on 1 July 2004. In making its decisions, the Commission has considered information and analysis from a range of sources, has given full consideration to all submissions from interested parties, and has received the advice of external experts.
- 3 This paper was previously issued by the Commission on 23 December 2003.¹ At that time, the Commission indicated that the paper would be re-issued along with the finalised Notice published in the *New Zealand Gazette* used to set the thresholds, updated to reflect any changes in technical detail. Subsequently, the Commission decided to publish the thresholds for distribution businesses and Transpower in two separate *Gazette* Notices, given that the start dates and lengths of the regulatory periods are different for Transpower than for other lines businesses.
- 4 On 11 February 2004, the Commission issued drafts of two *Gazette* Notices—namely the *Commerce Act (Electricity Distribution Thresholds) Notice 2004* and the *Commerce Act (Transpower Thresholds) Notice 2004*—and invited written submissions from interested parties on the technical details of the drafts, to ensure that the Notices give effect to the Commission's threshold decisions. Submissions were due by 1 March 2004.
- 5 Following revisions to take into account these submissions on the drafts, the *Commerce Act (Electricity Distribution Thresholds) Notice 2004* was published in the *Gazette* on 31 March 2004. This paper updates the paper of 23 December 2003 to reflect these revisions, and to provide clarifications where the Commission considered necessary. The Commission will publish the *Commerce Act (Transpower Thresholds) Notice 2004* in the *Gazette* by 30 June 2004.

¹ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime, Threshold Decisions (Regulatory Period Beginning 2004)*, 23 December 2003.

6 This paper is structured as follows.

Section	Content
Introduction	<ul style="list-style-type: none"> ▪ Purpose and scope of this paper ▪ The process by which the Commission has made its decisions
The Thresholds	<ul style="list-style-type: none"> ▪ The thresholds applying to distribution businesses from 1 April 2004 ▪ The thresholds applying to Transpower from 1 July 2004
Threshold Assessments	<ul style="list-style-type: none"> ▪ Threshold assessment process ▪ Demonstrating compliance against the price path threshold and the quality threshold
Conceptual Approach	<ul style="list-style-type: none"> ▪ Rationale for the price path and quality thresholds ▪ Conceptual approach to setting the parameters of the CPI-X price path threshold ▪ Views of interested parties on the conceptual approach ▪ Threshold options not implemented
Industry-Wide Performance (B Factors)	<ul style="list-style-type: none"> ▪ Methodology for determining the B factors ▪ Analysis of industry-wide lines business performance ▪ Views of interested parties on the B factors ▪ The Commission's decisions on the B factors
Relative Distribution Business Performance (C Factors)	<ul style="list-style-type: none"> ▪ Methodology for determining the C factors ▪ Analysis of relative distribution business performance ▪ Views of interested parties on the C factors ▪ The Commission's decisions on the C factors
Appendix 1	X factors for lines businesses
Appendix 2	Glossary of terms, abbreviations and acronyms

7 The rest of this section summarises the process to date by which the Commission has come to its decisions on the thresholds to apply to lines businesses from 2004.

Implementing the Targeted Control Regime

Purpose of the targeted control regime

8 The purpose of the targeted control regime, outlined in section 57E of subpart 1 of Part 4A is as follows:

The purpose of this subpart is to promote the efficient operation of markets directly related to electricity distribution and transmission services through targeted control for the long-term benefit of consumers by ensuring that suppliers -

- (a) are limited in their ability to extract excessive profits; and
- (b) face strong incentives to improve efficiency and provide services at a quality that reflects consumer demands; and
- (c) share the benefits of efficiency gains with consumers, including through lower prices.

- 9 Under subpart 1 of Part 4A, the Commission is required to set thresholds for the declaration of control in relation to lines businesses. The thresholds are, in effect, a screening mechanism to identify lines businesses whose performance may warrant further examination through a post-breach inquiry and, if required, control by the Commission.

Setting the initial thresholds

- 10 After consulting with interested parties on possible forms of thresholds, as is required under s 57G of the Act, on 6 June 2003 the Commission set two thresholds: a price path threshold, of the form CPI-X; and a quality threshold. (CPI is the consumer price index, and the 'X' represents the expected annual reduction in lines business average prices, in real terms). These thresholds, applying to distribution businesses until 31 March 2004 and to Transpower until 30 June 2004, were set by a Notice in the *Gazette* (Initial Notice),² and explained in a paper, *Regulation of Electricity Lines Businesses, Targeted Control Regime, Threshold Decisions*, published on the same day.
- 11 The price path threshold is conceptually similar to the various forms of CPI-X price control that regulators commonly use in other jurisdictions. However, the thresholds are not instruments of control and the price path threshold differs in many important respects from the price control mechanisms used elsewhere.
- 12 The assessment criteria set in relation to the initial price path threshold were set to be generally consistent with a CPI-X price path, in which prices at the end of each assessment period are not greater, in nominal terms, than the prices at the start of that period. All lines businesses were first assessed against the price path threshold as at 6 September 2003 (first assessment date). The second assessments against the price path threshold are as at 31 March 2004 for distribution businesses, and as at 30 June 2004 for Transpower.
- 13 The initial quality threshold has two assessment criteria. The first requires no material deterioration in quality, and the second requires lines businesses to meaningfully engage with consumers to determine their demand for service quality. Distribution businesses are first assessed against the initial quality threshold as at 31 March 2004. Transpower will be assessed as at 30 June 2004.

Setting the Thresholds to Apply from 2004

- 14 As part of its decisions on the initial thresholds, the Commission announced it would reset the parameters of the CPI-X price path threshold to apply from 1 April 2004 for distribution businesses and from 1 July 2004 for Transpower. A new *Gazette* Notice would therefore be issued to reset the thresholds in early 2004.
- 15 The Commission indicated that the X factors applying from 2004 could vary between lines businesses or groups of lines businesses according to business-specific factors. On 30 May 2003, the Commission issued a Discussion Paper,

² New Zealand *Gazette, Commerce Act (Electricity Lines Thresholds) Notice 2003*, 6 June 2003.

Resetting the Price Path Threshold (Discussion Paper).³ The Commission sought submissions from interested parties on the Discussion Paper, which outlined the process and framework the Commission intended to follow in resetting the X factors of the price path threshold.

- 16 The Commission also sought comments from interested parties regarding the integrity of data in two datasets of distribution business disclosure information, provided courtesy of the Ministry of Economic Development (MED). The first dataset comprised distribution business reliability and system statistics disclosed from 1995 to 2002 under the *Electricity (Information Disclosure) Regulations* 1994 and 1999 (Regulations). The second dataset comprised lines business financial information disclosed under the Regulations from 1999 to 2002. These datasets were disseminated to interested parties for comment.
- 17 On 5 September 2003, after taking into account submissions on the Discussion Paper and the information disclosure datasets, the Commission released its Draft Decisions on resetting the price path threshold (Draft Decisions).⁴ In making its draft decisions, the Commission drew on the methodology, analysis and conclusions presented in a report prepared for the Commission by Meyrick and Associates (Meyrick). This report (Initial Report) presented Meyrick's initial analysis of industry-wide transmission and distribution business performance, and relative distribution business performance, for the period 1996-2002.⁵
- 18 The primary data sources for Meyrick's initial analysis were the revised information disclosure datasets provided by the MED for 1995-2002 (described above), and also other information disclosure data published in the *Gazette* or on lines business websites for the same period. The Commission invited submissions by 20 October 2003 from interested parties on the Draft Decisions and Meyrick's Initial Report, as well as on Meyrick's models and database. The Commission indicated that it would make its final decisions after taking into account the submissions, and also the results of an updated analysis of lines business performance including 2003 disclosure data as well.
- 19 A conference was held at the Commission from 3 to 6 November 2003 to provide interested parties with the opportunity to present their submissions on the Draft Decisions and Meyrick's Initial Report. Presentations were made by: Grey Power; the Major Electricity Users' Group (MEUG); PricewaterhouseCoopers (PwC), on behalf of 18 lines businesses;⁶ the Electricity Networks Association (ENA); Aurora Energy (formerly Dunedin Electricity); Marlborough Lines; Orion New Zealand, including presentations from National Economic Research

³ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime, Resetting the Price Path Threshold, Discussion Paper*, 30 May 2003.

⁴ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime, Draft Decisions, Resetting the Price Path Threshold*, 5 September 2003.

⁵ Meyrick and Associates, *Regulation of Electricity Lines Businesses, Resetting the Price Path Threshold—Comparative Option, Report Prepared for the Commerce Commission*, 3 September 2003.

⁶ PwC's submission (and cross submission) was prepared on behalf of: Alpine Energy, Counties Power, Eastland Network, Electra, Electricity Ashburton, Electricity Invercargill, Horizon Energy, MainPower New Zealand, Marlborough Lines, Nelson Electricity, Network Waitaki, Northpower, OtagoNet, ScanPower, The Lines Company, The Power Company, Top Energy, and WEL Networks.

Associates (NERA); Powerco, including presentations from Pacific Economics Group (PEG) and Benchmark Economics; The Lines Company; Transpower New Zealand; Unison Networks; Vector, including presentations from Charles River Associates (CRA); and WEL Networks. Additional submissions on the Draft Decisions, not supported by presentations at the conference, were received from Brookfields, Counties Power, Electricity Ashburton, Horizon Energy, Network Tasman, and Waipa Networks.

- 20 At the conference, the Commission invited cross submissions by 19 November 2003. In addition, the Commission asked a number of presenters to provide further information in support of their presentations. Cross submissions and/or responses to the Commission's requests for further information were received from: MEUG; PwC, on behalf of the same group; Aurora; Counties Power; Marlborough Lines; Orion, including further material from NERA; Powerco; Transpower; Vector, with a separate cross submission from CRA; and WEL Networks. Submissions, cross submissions, comments on the database and models, as well as transcripts from the conference, are all available on the Commission's website (www.comcom.govt.nz/electricity/register.cfm).
- 21 In making its final decisions presented in this paper, the Commission has drawn on the updated analysis of lines business performance (i.e. including disclosure data from 2003) presented in a report prepared for the Commission by Meyrick (Final Report). Meyrick's Final Report was released by the Commission along with the 23 December 2003 version of this paper.⁷
- 22 The Commission thanks all interested parties for their considered and thoughtful submissions, and particularly commends those interested parties that undertook analytical work in support of their views.

Further consultation on substantive issues

- 23 The Commission considers issues of substance that are relevant to the way in which the thresholds have been implemented may arise from time to time over the regulatory period. It is possible that the Commission may consequently consider it consistent with the Purpose Statement of subpart 1 of Part 4A to modify its implementation of the thresholds it has set, after it has sought and considered the views of interested parties.
- 24 The Commission may consult during the regulatory period in order to:
- define or clarify the nature and significance of any issue (or combination of issues);
 - seek the views of interested parties on proposed revisions to the way the thresholds are implemented; and

⁷ Meyrick and Associates, *Regulation of Electricity Lines Businesses, Analysis of Lines Business Performance (1996-2003), Report Prepared for the Commerce Commission*, 19 December 2003. Since releasing Meyrick's Final Report, the Commission has been made aware of a transcription error in Table 5 on p 62 of that report. The values for Powerco's tax adjusted residual rate of return estimates for 2001, and for its three year average, should be 9.09% and 9.1%, respectively.

- seek the views of interested parties on specific amendments to the wording of one or other of the *Gazette* Notices.
- 25 The outcome of such consultations may or may not result in the Commission proposing amendments to a *Gazette* Notice. The Commission's preference is to keep any amendments to each *Gazette* Notice to a minimum.
- 26 Should any amendments to a *Gazette* Notice be considered necessary or desirable, the Commission intends that all proposed amendments to that Notice should, so far as is practicable, be issued for consultation at the same time, and consultation on the amended Notice would only occur once in each year of the regulatory period. Amendments to a *Gazette* Notice would in most circumstances take effect from the beginning of the following year of the regulatory period, and not apply to the current year. Furthermore, consultation on the drafts of an amended *Gazette* Notice would, wherever possible, be undertaken in sufficient time for lines businesses to take those amendments into account when setting their line charges for the subsequent year of the regulatory period.

THE THRESHOLDS

- 27 This section summarises the Commission's decisions for the thresholds applying to distribution businesses from 1 April 2004 and to Transpower from 1 July 2004.
- 28 In making its decisions, the Commission has considered submissions from interested parties on its earlier papers and drawn on analysis undertaken by Meyrick. More detail on the submissions and analysis is provided in the three later sections on conceptual approach, industry-wide performance, and relative distribution business performance (beginning at paragraphs 97, 173 and 243, respectively).

Thresholds for Distribution Businesses

- 29 Similarly to its threshold decisions of 6 June 2003, the Commission has decided to set two thresholds for the regulatory period beginning in 2004 (i.e. 1 April 2004 for distribution businesses, and 1 July 2004 for Transpower): a price path threshold and a quality threshold.

The price path threshold

- 30 The initial price path threshold for distribution businesses, set by the Commission on 6 June 2003, is of the form CPI-X, with threshold criteria applying until 31 March 2004.
- 31 This initial form of the price path threshold is retained for distribution businesses from 1 April 2004. However, new criteria and X factors apply. Distribution businesses will be assessed annually against this reset threshold over a regulatory period of five years that begins on 1 April 2004.

The quality threshold

- 32 The initial quality threshold, set by the Commission on 6 June 2003, is retained for distribution businesses from 1 April 2004, and will apply for the five-year regulatory period.
- 33 The quality threshold retains its two assessment criteria. The first criterion requires no material deterioration in quality. For distribution businesses, quality will be monitored through trends in SAIDI and SAIFI, which will be assessed annually. The second criterion requires distribution businesses to meaningfully engage with consumers to determine their demand for service quality, and will be assessed at least once every two years.
- 34 Toward the end of the regulatory period, if it still retains its responsibilities and functions under Part 4A of the Act, the Commission intends undertaking a full review of the thresholds regime. New thresholds would be set for the next regulatory period following consultation with interested parties.

The purpose of the thresholds

- 35 The purpose of the price path threshold is to provide incentives for lines businesses to improve efficiency, to share the benefits of efficiency gains with consumers over the long term, including through lower prices (in real terms), and to be limited in their ability to extract excessive profits.
- 36 The purpose of the quality threshold is to provide incentives for lines businesses to not allow their reliability to fall as a means of reducing costs in response to the price path threshold, and to supply electricity distribution and transmission services at a quality that reflects consumer demands.
- 37 Setting both a price path threshold and a quality threshold acknowledges that there is a trade-off between the price and quality of lines services. Nevertheless, the Commission has not yet been able to integrate this trade-off into a single threshold. However, in making its decisions, the Commission has given careful consideration to ensuring that lines businesses will still retain incentives to invest in their networks and to maintain quality of service, including reliability of supply.
- 38 In combination, the two thresholds are consistent with a targeted control regime for the long-term benefit of consumers and consistent with the specific outcomes sought in the Purpose Statement of subpart 1 of Part 4A (paragraph 8).

Setting the X factors in the price path threshold

- 39 The Commission has used a comparative approach to allocate distribution businesses to four groups, with each group being assigned a different X factor. The X factors reflect distribution industry productivity as a whole, as well as relative distribution business productivity and profitability.
- 40 Any distribution business whose average price changes at an annual rate exceeding the change in the CPI, less the annual rate of X% that is set by the Commission for that business, will breach the threshold. (The actual expression for the threshold is provided in paragraph 70 below).
- 41 The X factors applicable to each distribution business over the five-year regulatory period are provided in Appendix 1. Three businesses fall into the group assigned an X factor of -1%, whereas all other distribution businesses have been assigned X factors of 0%, 1% or 2%. Assuming that the consumer price index stays at its current level of about 1.5%, a business assigned an X of 2% would be expected to reduce its average prices by around 0.5% per annum from April 2004.
- 42 Should distribution businesses be involved in merger or acquisition activity during the regulatory period, then a new X factor will become applicable to the resultant business or businesses (paragraph 76).

Definition of price

- 43 As in the initial price path threshold, set on 6 June 2003, 'price' in the threshold to apply from 1 April 2004 means the average price for 'specified' lines services

(paragraph 61), adjusted for certain ‘pass-through’ costs. This price is a weighted average of all the relevant tariffs of a particular distribution business, because most distribution businesses employ a combination of fixed charges per connection, energy-based rates, demand-based rates, peak period rates, and various other tariffs, which may differ between customer classes. In this paper, the Commission also refers to average price as ‘base-weighted notional annual revenue’ or ‘notional revenue’.

- 44 Base-weighted notional annual revenue is the annualised revenue that would result from applying each set of tariffs to the same set of base quantities (e.g. customer numbers, energy delivered in kWh, maximum demand in kW, connected capacity in kVA, etc), net of pass-through costs. The Commission’s views on pass-through costs are presented below from paragraph 63.

Starting prices

- 45 As with the initial price path threshold, the Commission proposes that the relevant prices for the price path applying from 1 April 2004 are average prices before rebates and/or discounts (i.e. posted prices).⁸ Unless a distribution business has breached the price path threshold at the second assessment date under the initial price path threshold (i.e. 31 March 2004), the starting price for the price path threshold beginning on 1 April 2004 will be the same as the average price at the second assessment date.
- 46 If a distribution business is identified by the Commission to be in breach of the price path threshold as at the second assessment date, the appropriate starting price will be the maximum average price level that would not have caused that business to breach the threshold.

Thresholds for Transpower

- 47 In its threshold decisions of 6 June 2003, the Commission set a price path threshold for Transpower of the form CPI-X, with threshold criteria applying until 30 June 2004.
- 48 This form of price path threshold is retained for Transpower from 1 July 2004 for a period of one year, primarily due to uncertainties regarding the approach the Electricity Commission will take with respect to Transpower’s investment programme. Transpower will still face incentives to reduce prices in real terms and to improve efficiency, as it has been assigned a positive X factor of 1%.
- 49 The starting price for Transpower’s one year price path will be based on Transpower’s average price at 30 June 2004, excluding any charges for economic value (EV) adjustments.
- 50 The initial quality threshold, set by the Commission on 6 June 2003, will also be retained for Transpower for one year from 1 July 2004. As for distribution businesses, the quality threshold comprises a reliability criterion and a consumer engagement criterion. However, for Transpower, quality is monitored through

⁸ However, discounts may be considered to be a posted price, provided those discounts are disclosed in accordance with Part 6 of the Electricity Information Disclosure Requirements 2004.

trends in the number of unplanned interruptions, and total interruptions expressed as system minutes.

- 51 The Commission will continue to monitor how the approach taken by the Electricity Commission to Transpower's investment programme may affect the implementation of the targeted control regime under Part 4A as it applies to Transpower. At this stage the Commission intends setting new thresholds applying to Transpower from 1 July 2005, following consultation with interested parties during 2004.

THRESHOLD ASSESSMENTS

52 This section outlines the threshold assessment process and provides guidance on how lines businesses can demonstrate compliance with the thresholds.

Threshold Assessment Process

53 As with the initial thresholds, each lines business will be required, pursuant to section 57T of the Act, to provide the Commission with annual written statements, confirming its compliance, or otherwise, with each of the thresholds. These threshold compliance statements should include sufficient evidence in the form of revenues, prices, costs, reliability indices and other data, supporting the declaration.

54 Threshold compliance statements are to be signed by two directors of the lines business and must be accompanied by a signed independent auditor's report to the effect that, with the exception of historical reliability statistics, the compliance statement provided gives a true and fair view of the matters to which it relates. The *pro forma* certificates setting out the Commission's minimum requirements in this respect are included as Schedules to the *Gazette* Notices used to set the thresholds.

55 For the purposes of a compliance statement audit, an independent auditor means a person who:

- is qualified for appointment as auditor of a company under the Companies Act 1993;
- has no relationship with, or interest in, the lines business, being a relationship or interest that is likely to involve that person in a conflict of interest;
- has the necessary expertise to properly undertake the audit; but
- need not be the same as the person who audits the accounts of the lines business for any other purpose.

56 The Commission requires that it receive the compliance statements containing the self assessments of each lines business no later than 40 working days after each assessment date.

57 In fulfilling the requirement to assess lines businesses against the thresholds, the Commission considers that the appropriate time to consider information and explanations provided by lines businesses will be after receiving compliance statements. Therefore, prior to receiving the compliance statements, the Commission does not intend to hold discussions with lines businesses or auditors regarding any issue on which the Commission may need to exercise its discretion (for example, what is included or excluded under the definition of specified services).

- 58 Lines businesses are also required, within 35 working days of the relevant assessment date, to publicly disclose the compliance statements and publish them on the Internet. Any confidential information may be removed, but the Commission reserves the right to subsequently require its disclosure, if the Commission is not satisfied with the reasons for withholding the information.
- 59 Before assessing lines businesses against the thresholds, the Commission will make an initial review of the compliance statements. During this initial review process, the Commission may seek clarification or confirmation of the information provided. The Commission may use the provisions of s 57U(1)(b) of the Act, if necessary, to require further information to be provided.
- 60 The initial review period is an opportunity for lines businesses, at the Commission's request, to explain aspects of their self assessments. This will not be an opportunity to justify the performance in question, but rather to clarify information where required.

Price Path Threshold

Excluded distribution services

- 61 'Specified' distribution services include all services supplied in markets directly related to electricity distribution except those provided in markets with workable or effective competition. Distribution businesses should indicate which, if any, line services they have excluded in their threshold compliance statements, and provide evidence, to the satisfaction of the Commission, that the exclusions are warranted.
- 62 The Commission reserves the right to ultimately determine which services, if any, can be excluded in a price path threshold assessment. Moreover, the Commission may require distribution businesses to provide further evidence, if necessary, justifying any exclusions they have identified in threshold compliance statements, during its review of those statements.

Distribution cost pass-throughs

- 63 The price path threshold provides for the 'pass through' of certain operating costs—specifically transmission charges, territorial local authority rates, as well as any levies imposed by the Electricity Commission—on the grounds that these are largely beyond distribution businesses' control, and are not always stable or predictable.
- 64 'Transmission charges' means the net amount a distribution business is liable to pay to Transpower or other parties in relation to transmission services (or avoided transmission services) during the relevant period. These charges include any amounts received from or payable to Transpower or other parties in relation to connection, interconnection and EV adjustments, as well as charges associated with new investment contracts, the provision of system operator services, loss and constraint rentals, and the settlement of financial transmission rights.

- 65 ‘Rates’ means any rates on system fixed assets, as defined in the Commission’s Electricity Information Disclosure Requirements (Requirements),⁹ paid or payable during the period concerned to territorial local authorities under the Rating Powers Act 1988 and/or the Local Government (Rating) Act 2002.
- 66 Where a distribution business can demonstrate to the satisfaction of the Commission that it has transparently passed through to its customers transmission charges, rates and/or Electricity Commission levies, those amounts will be excluded from the calculation of notional revenue.

Transmission service exclusions and cost pass-throughs

- 67 ‘Specified’ transmission services are those related to connection to Transpower’s network and the conveyance of electricity through that network. Transpower should indicate which services it has excluded in its threshold compliance statement, and provide evidence, to the satisfaction of the Commission, that the exclusions are warranted.
- 68 Like distribution businesses, Transpower may pass through rates on system fixed assets payable to territorial local authorities, and any Electricity Commission levies. Where Transpower can demonstrate to the satisfaction of the Commission that it has transparently passed through to its customers rates and/or Electricity Commission levies, those amounts will be excluded from the calculation of notional revenue.

Demonstrating compliance with the price path threshold

- 69 The approach taken by lines businesses to demonstrate compliance with the price path threshold assessment criteria may vary according to specific circumstances. In particular, calculating the average price (base-weighted notional annual revenue) path is likely to be more straightforward for lines businesses whose tariffs do not change during the regulatory period.
- 70 Distribution businesses will be assessed annually against this threshold using price information as at 31 March each year, beginning 31 March 2005. Transpower will be assessed as at 30 June 2005. The comparison of prices will be on the basis of the following formula:

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

where:

- t denotes the calendar year during which the assessment date occurs;
- NR_t is the notional revenue for the assessment period ending in calendar year t , being equal to $\sum_i P_{i,t} Q_i - K_t$;

⁹ Commerce Commission, *Electricity Information Disclosure Requirements 2004*, 31 March 2004.

- i denotes each price pertaining to every specified service;¹⁰
- $P_{i,t}$ is the i^{th} price at the assessment date occurring in calendar year t ;
- Q_i is the base quantity corresponding to the i^{th} price for the year ending 31 March 2003 or, if a business restructures its prices during the assessment period, is the base quantity corresponding to the i^{th} price for the most recent year ending 31 March during which the distribution business has restructured its prices;
- K_t is the sum of all pass-through costs for the assessment period ending in calendar year t ;
- R_t is the allowable notional revenue under the CPI-X price path at the assessment date occurring in calendar year t , being equal to $R_{t-1}(1 + \Delta CPI_t)(1 - (B + C_j))$, where the initial value for the price path, at the reference date, is R_{2004} ;
- R_{2004} is the maximum notional revenue at the reference date which would not have caused the distribution business to breach the price path threshold under the Initial Notice at that date (subject to paragraphs 72 and 74-76 below) and in all cases using the same base quantities used to determine NR_t ;
- ΔCPI_t is the change in the consumer price index over the period between assessments as a percentage (calculated as shown in paragraph 78);
- B is an annual real reduction in notional revenue over the period based on distribution or transmission productivity growth (equal to 1% for all lines businesses); and
- C_j is an annual real reduction (or increase) in notional revenue over the period, based on the relative performance of distribution businesses in peer group j (zero for Transpower).

- 71 The above expression indicates that lines businesses are expected to reduce notional revenue annually in real terms by a combination of B% (plus C% for distribution businesses). The sum of B and C is the X factor applying to that lines business. The X factors for each business are listed in Appendix 1 of this paper.
- 72 The quantities (Q_i) in the above expression represent the base-weight volumes provided in the relevant threshold compliance statement for the second assessment date, as long as the Commission has deemed those values appropriate during its review of that statement. If a lines business has restructured its prices during an assessment period, then the base quantities are those applying at the end of the most recent assessment period in which the business restructured its prices.
- 73 In addition to satisfying the above expression, to comply with the price path threshold, the notional revenue of a lines business at any time during each year of

¹⁰ As in the Initial Notice of 6 June 2003 (above n 2), the quantity to which each tariff applies includes the number of connections, energy delivered in kWh, maximum demand in kW, transformer capacity in kVA, and so on.

the regulatory period must not exceed the greater of its notional revenue at the previous assessment date and its notional revenue at the current assessment date.

- 74 Where the tariff structure has changed since the beginning of the regulatory period, the lines business should provide evidence of the effective change in average price (base-weighted notional annual revenue). In such a case, the expression in paragraph 70 will apply as if the new price structure applied on and from 31 March 2004 (30 June 2004 for Transpower).
- 75 Because transmission and distribution services are to some extent substitutes, and the boundary between transmission and distribution services can change over time, it is possible that some movements in transmission charges will be offset by opposite movements in distribution costs. Hence, if fixed assets used for providing specified services are transferred between Transpower and a distribution business, the distribution business should provide the Commission with evidence that, all other things being equal, the transfer did not create an increase in revenue for the business, above that which would have applied if the transfer had not occurred. In such a case, the expression in paragraph 70 will apply as if the transfer occurred on 31 March 2004.
- 76 Where a distribution business is involved in a business merger or acquisition that results in a change in its total customers or system length of 10% or more, the X factor to be applied to that business will be the weighted average of the previously applicable X factors, weighted by disclosed customer numbers from the past disclosure year. In such a case, the expression in paragraph 70 will apply as if the transaction occurred on 31 March 2004.
- 77 If the Commission is satisfied that, because of lack of information or the price path expression being clearly meaningless in respect of a particular lines business, it is not practicable to determine whether that lines business has complied with the price path threshold, the lines business would need to demonstrate, to the satisfaction of the Commission, that compliance could be demonstrated through the use of an alternative approach that has an equivalent effect.

Calculation of the price index

- 78 The following formula should be used to calculate the rate of change in CPI:

$$\Delta CPI_t = \frac{CPI_{Q1,t-1} + CPI_{Q2,t-1} + CPI_{Q3,t-1} + CPI_{Q4,t-1}}{CPI_{Q1,t-2} + CPI_{Q2,t-2} + CPI_{Q3,t-2} + CPI_{Q4,t-2}} - 1$$

where:

$CPI_{Qj,y}$ is the consumer price “All Groups Index SE9A” figure published by Statistics New Zealand for the quarter j in the calendar year y .

- 79 This method of calculating inflation adjusts prices for the average level of inflation experienced by the lines business over the course of a year. The relevant four quarters in the expression are the most recent four quarters for which actual data will be available.

Further consultation on the price path expression

80 In their submissions on the draft *Gazette Notices* (paragraph 4), Orion and Meridian Energy drew the Commission's attention to an anomaly in the price path expression.¹¹ The Commission intends to consult further on this issue later in 2004. If a change to the expression, as presented in paragraph 70 above, is subsequently deemed necessary for the full intent of the threshold to be achieved over the regulatory period, any change to the expression would take effect from 1 April 2005.

Quality Threshold

- 81 The Commission will assess lines businesses against a quality threshold based upon two criteria:
- no material deterioration in reliability, assessed on the basis of a quantitative analysis of reliability performance data; and
 - meaningful engagement with consumers to determine their demand for service quality, assessed on the basis of a qualitative review of, for example, disclosed asset management plans (or similar).
- 82 If the Commission is satisfied that, because of lack of information, it is not practicable to determine whether a lines business has complied with the reliability criterion, the lines business will need to demonstrate to the satisfaction of the Commission, that compliance can be demonstrated through the use of an alternative approach that has an equivalent effect.
- 83 In the case of the consumer engagement criterion, the Commission does not intend to prescribe the manner in which lines businesses demonstrate compliance. The Commission is aware that distribution businesses are required to disclose asset management plans annually, and considers that consumer engagement should be central to the asset management planning process. Therefore, the documented asset management plans are likely to be an important component for demonstrating compliance with the consumer engagement criterion, provided the Commission is satisfied with the scope and detail of such plans, and with the nature of engagement with consumers.
- 84 Compliance against the reliability criterion will be assessed by the Commission on an annual basis. However, some interested parties have submitted that requiring distribution businesses to demonstrate compliance with the consumer engagement criterion on an annual basis would be an onerous requirement. The Commission considers that, as long as a business has demonstrated, at the previous assessment date, it has meaningfully engaged with consumers to determine their demand for service quality, it only need demonstrate compliance with the consumer engagement criterion at the end of the second and fourth years of the regulatory period. Should a business not be able to demonstrate compliance

¹¹ Orion, *Regulation of Electricity Lines Businesses, Targeted Control Regime, Submission on the Draft Gazette Notices Dated 10 February 2004*, 1 March 2004, pp 1-2; Meridian, *Submission on Draft Gazette Notices*, 1 March 2004, pp 1-2.

with this criterion to the satisfaction of the Commission, then the Commission may require that business to demonstrate compliance more frequently.

Reliability criterion for distribution businesses

- 85 The reliability criterion for distribution businesses is based on two standard measures defined under the Requirements, namely:
- SAIDI, being the sum of SAIDI in respect of interruptions planned by the distribution business and unplanned interruptions arising in the network of the distribution business; and
 - SAIFI, being the sum of disclosed SAIFI for planned and unplanned interruptions.
- 86 Planned and unplanned interruptions in this context have the same meaning as Class B and Class C interruptions, as defined in the Requirements. At this stage, the Commission intends to rely upon the definition provided in the Requirements, but as part of its planned review of the Requirements during 2004, it will consider developing guidelines to ensure that distribution businesses measure and record these and other performance indices in a consistent manner.
- 87 A distribution business will comply with the reliability criterion if neither SAIDI nor SAIFI for the relevant year, exceeds its five-year average from March 1999 to March 2003, as follows:

$$S_t \leq \left(\frac{S_{1999} + S_{2000} + S_{2001} + S_{2002} + S_{2003}}{5} \right)$$

where:

S_t is the SAIDI or SAIFI disclosed for year t (ended 31 March).

- 88 Any distribution business breaching the reliability criterion may provide the Commission with an explanation supported by evidence of mitigating circumstances. The Commission will consider such explanatory information and will not investigate further if it is satisfied the breach was due to uncontrollable circumstances.
- 89 Where a distribution business has been involved in a business merger or acquisition that results in a change in its total customers or system length of 10% or more, the expression in paragraph 87 will apply as if the transfer occurred on 31 March 1998. The relevant SAIDI and SAIFI measures are to be calculated as weighted averages of the previously disclosed indices for the relevant parts of the pre-merger businesses, weighted by disclosed customer numbers.
- 90 If fixed assets used for providing specified services are transferred between Transpower and a distribution business, the distribution business should provide the Commission with evidence that, all other things being equal, the transfer did not create an increase in SAIDI or SAIFI for the business, above that which would have applied if the transfer had not occurred. In such a case, the expression in paragraph 87 will apply as if the transfer occurred on 31 March 2004.

Reliability criterion for Transpower

- 91 The reliability criterion for Transpower is based on two standard measures disclosed under the Requirements, namely:
- number of unplanned interruptions; and
 - total interruptions expressed as system minutes.
- 92 Transpower will comply with the reliability criterion if neither of these measures for the year ended 30 June 2005 exceeds its previous five-year average from 1999 to 2003, as follows:

$$S_{2005} \leq \left(\frac{S_{1999} + S_{2000} + S_{2001} + S_{2002} + S_{2003}}{5} \right)$$

where:

S_{2005} is the number of unplanned interruptions or the total system minutes disclosed for the year ended 30 June 2005.

Consumer engagement criterion

- 93 The Purpose Statement in subpart 1 of Part 4A of the Act requires that lines businesses face strong incentives to provide services at a quality that reflects consumer demands. The Commission therefore considers lines businesses should be able to demonstrate:
- how they engage with consumers, directly or indirectly, to explain the trade-offs between quality and price, and to assess consumers' willingness to pay for different quality levels;
 - what service offers or commitments they make to consumers, directly or indirectly, in response to information obtained during these engagements;
 - how they make decisions about target quality levels;
 - what types of contractual or other arrangements, if any, they enter into in relation to quality; and
 - how they plan to deliver the target quality in terms of medium-term service delivery.
- 94 For the avoidance of doubt, the Commission does not require lines businesses to embark upon exhaustive or comprehensive research into consumers' willingness to pay for different levels or quality of line services. However, the Commission does require lines businesses to demonstrate that they have well-developed business processes directed at understanding and responding to the preferences of consumers.
- 95 Distribution businesses may choose to engage directly with consumers and/or consumer groups, and/or via the retailers with which they have use of system

agreements. However, in the latter cases, distribution businesses should be confident, and should seek to demonstrate to the satisfaction of the Commission, that the retailers or consumer groups accurately reflect the interests of the consumers which they supply or represent.

- 96 Similarly, Transpower may choose to engage with distribution businesses and/or retailers as proxies for consumers that are not directly connected to its network, if it is confident, and can demonstrate to the Commission's satisfaction, they accurately represent the interests of those consumers.

CONCEPTUAL APPROACH

97 This section outlines the conceptual approach used by the Commission to set the price path and quality thresholds, having taken into account submissions from interested parties. It also provides a brief overview of alternative options for setting the thresholds that have been considered, but not implemented, by the Commission.

Rationale for the Price Path and Quality Thresholds

98 In combination, the price path and quality thresholds are consistent with a targeted control regime that is for the long-term benefit of consumers and achieves the specific outcomes sought in the Purpose Statement of subpart 1 of Part 4A of the Act.

99 Setting both a price path threshold and a quality threshold acknowledges that there is a trade-off between the price and quality of lines services. Nevertheless, the Commission has not yet been able to integrate this trade-off into a single threshold. However, in making its decisions, the Commission has given careful consideration to ensuring that lines businesses will still retain incentives to invest in their networks and to maintain quality of service, including reliability of supply.

Role of the thresholds

100 A number of lines businesses, notably Unison and Powerco, have argued that attempting to meet all of the objectives of the Purpose Statement through the thresholds is inappropriate.¹² The Commission acknowledges that the Purpose Statement will not necessarily be fully achieved in the case of every lines business by the price path and quality thresholds alone. While the Commission considers that lines businesses should regard the declaration of control as an outcome to be avoided where possible, the purpose of the targeted control regime may not be achieved if lines businesses endeavour to avoid breaching the thresholds under all circumstances or at all costs.

101 For instance, although the price path threshold is conceptually similar to the various forms of CPI-X price control that regulators commonly use in other jurisdictions, such as Australia and the UK, it differs in important respects. Under the targeted control regime, the price path threshold is not an instrument of control, but a screening mechanism to identify businesses whose performance may warrant control.

102 Consequently, the Commission aims to achieve the Purpose Statement through the targeted control regime as a whole, which includes the thresholds, post-breach inquiries, administrative settlements, authorisations and alternative undertakings.

¹² Powerco, *Resetting the Price Path Threshold, Powerco's Response to the Commerce Commission's Draft Decisions*, 20 October 2003, p 9; Unison, *Submission by Unison Networks Limited on Regulation of Electricity Lines Businesses, Targeted Control Regime, Draft Decision, Resetting the Price Path Threshold*, 20 October 2003, p 3.

These aspects of the targeted control regime are outlined in the Commission's assessment and inquiry guidelines (currently in draft form).¹³

- 103 A number of lines businesses have suggested that the Commission should undertake a cost-benefit analysis of the overall thresholds regime. The Commission considers that concerns regarding the benefits of the targeted control regime will be mitigated through its approach to undertaking threshold assessments and post-breach inquiries. Under s 57K(1) of the Act, the Commission is able to prioritise its duties under subpart 1 of Part 4A by exercising its powers to make a declaration of control in relation to one or any (but not necessarily all) of the lines businesses that are identified as having breached a threshold.
- 104 In prioritising the need for undertaking post-breach inquiries and in deciding whether to declare control, the Commission intends taking into account its standard enforcement criteria of conduct, detriment and public interest, subject to the Purpose Statement of subpart 1 of Part 4A. Given that targeted control is “for the long-term benefit of consumers”, the Commission intends undertaking a net benefits analysis of the potential direct and indirect costs and benefits of control before making a declaration of control.
- 105 Some interested parties have pointed to the small component of consumers' electricity bills that contributes to network services, and expressed the concern that the benefits from any reductions in line charges will be captured by electricity retailers. The Commission highlights that it has no jurisdiction under Part 4A of the Act to address this issue.

Key principles

- 106 The principle outlined above, namely that the thresholds are not intended to be an instrument of control, is one of the key principles that the Commission has taken into account in selecting the approach used to set the thresholds, and the methodologies used to set the parameters of the CPI-X price path threshold (Table 2 below).

Table 2 – Key Principles for Setting the Thresholds

Category	Key Principles
Regulatory Framework (Incentive Effects)	<ul style="list-style-type: none"> ▪ Provides incentives for improved efficiency and for quality of service that reflects consumer demands; ▪ Limits excessive profits and shares the benefits of efficiency gains with consumers, without markedly reducing incentives for efficiency; ▪ Is consistent with the intent of a threshold, as opposed to a form of control; and ▪ Minimises distortionary impacts on the operational and investment decisions of lines businesses, taking into account different ownership arrangements in the industry.

¹³ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime, Draft Assessment and Inquiry Guidelines (Process and Analytical Framework)*, 7 August 2003.

Category	Key Principles
Implementation	<ul style="list-style-type: none"> ▪ Is methodologically robust, replicable and transparent (to the extent appropriate for a threshold, rather than control); ▪ Is cost effective and minimises regulatory risk and uncertainty, while satisfying statutory objectives; and ▪ Takes account, where practicable, of industry-specific factors, such as the use of rebates by trust-owned lines businesses.

Incentive effects of the CPI-X price path threshold

- 107 In a control context, CPI-X regulation is a form of ‘incentive regulation’ introduced to address the concern that the traditional ‘cost of service’ (rate of return) approach to regulating utilities, while potentially controlling for excessive profits, may harm the incentives on firms to improve efficiencies.
- 108 A CPI-X price path places incentives on regulated firms to mimic the outcomes that would be achieved in a competitive market. Competition leads to industry output prices reflecting industry unit costs, including a normal rate of return on the market value of assets. Because no individual firm can influence industry costs, each firm has a strong incentive to maximise its productivity performance to achieve lower unit costs than the rest of the industry. This process leads to the industry operating as efficiently as possible at any point in time and the benefits of productivity improvements being passed on to consumers relatively quickly.
- 109 Because the provision of electricity distribution and transmission services is often subject to decreasing costs (i.e. economies of scale), competition is normally limited and incentives to minimise costs and to provide the best quality of service to electricity consumers are not strong. Although the CPI-X price path is a threshold rather than a form of control, it will still strengthen these incentives by imposing similar pressures on lines businesses to the process of competition.¹⁴
- 110 Therefore, in responding to the incentives provided by the price path threshold, lines businesses will be limited in their ability to extract excessive profits, and will also face strong incentives to improve efficiency and share the benefits of efficiency gains with consumers over the long term.

Incentive effects of the quality threshold

- 111 In responding to the incentives provided by the reliability criterion of the quality threshold, lines businesses will ensure their reliability does not fall as a means of reducing costs in response to the price path threshold. In addition, the consumer engagement criterion will provide incentives for businesses to determine the price/quality trade-offs which consumers are prepared to make in relation to distribution and transmission services, thereby assisting businesses to provide services at the quality demanded by consumers.

¹⁴ Meyrick, December 2003, above n 7, Section 2.

Implementing the CPI-X Price Path Threshold

CPI-X price path parameters and methods

- 112 The key parameters in a CPI-X price path are: the starting price at the beginning of the regulatory (or reset) period; the rate of expected annual efficiency gains (i.e. the X factor); and the length of the regulatory period (i.e. until the next reset).
- 113 When used for control, the regulator sets the starting price for each firm at the beginning of the assessment period, which may be at, above or below the existing price, and then caps or limits the annual percentage change in that price to the Consumer Price Index (CPI) less the X factor (reflecting expected efficiency gains). In addition, the regulator generally needs to specify minimum quality standards for the relevant goods and services, to ensure quality does not deteriorate as a means for regulated entities to cut costs to meet the price path.
- 114 There are many different methods that can be used to determine the values of the parameters in a CPI-X price path. Key approaches include:
- ‘index-based’ methods, typically implemented through the application of total factor productivity (TFP) analysis;
 - ‘building block’ methods, typically implemented by estimating and then combining efficient component costs for operating expenditure, depreciation, and the cost of capital based on the weighted average cost of capital (WACC); and
 - ‘frontier’ methods, using analytical tools such as data envelopment analysis (DEA) and stochastic frontier analysis (SFA).

Implementation principles

- 115 A number of lines businesses have stressed the importance of facilitating industry acceptance of the thresholds, by taking particular account of implementation principles of replicability, practicality, reasonableness and simplicity. Some businesses have acknowledged that the available timeframe and the availability of data has constrained the choices that the Commission can make on the methodologies used to set the parameters of the price path threshold, and that robustness can be sacrificed to some extent depending on the nature of the post-breach processes.
- 116 The Commission considers that the approach it has used to derive the X factors for lines businesses is sufficiently robust for the purpose of setting thresholds, despite concerns regarding the quality of the data used in the underlying analysis. The Commission has also encouraged replicability by posting the models and database used in the various stages of the analysis undertaken for the Commission on its website. A number of interested parties have commented on the high level of transparency associated with the Commission’s process and analysis associated with its decisions on the thresholds.

Determining the X Factors

Components of the X factors for distribution businesses

- 117 The Commission has considered a number of possible dimensions that could be taken into account in setting the parameters of the CPI-X price path threshold:
- the potential for industry-wide productivity gains over and above economy-wide improvements in the future;
 - the ability of individual lines businesses to achieve efficiencies in the future;
 - the extent to which lines business revenue is likely to cover, exceed or fall short of its operating and capital costs (including the cost of capital); and
 - the quality of service demanded by consumers, in light of the trade-offs consumers make between price and quality.
- 118 Relating to all these dimensions is the time dimension (i.e. the speed of adjustment incentivised by the price path threshold).
- 119 New Zealand's electricity distribution industry is still evolving and faces a range of operating environments. Individual distribution businesses are therefore likely to exhibit a range of productivity and profitability levels. Hence, while the variation in performance remains fairly broad, there is a strong case for not applying a common X factor to all distribution businesses under the CPI-X price path threshold.
- 120 Consequently, the Commission has used a comparative approach to setting the parameters of the CPI-X price path threshold for distribution businesses, where the X factor is found from the sum of:
- a *B factor*, reflecting expected industry-wide improvements in efficiency (on average); and
 - a *C factor*, reflecting the relative performance of distribution businesses, and found from the sum of two component factors:
 - a relative productivity component (a *C₁ factor*); and
 - a relative profitability component (a *C₂ factor*).
- 121 In combination, the B and C factors encompass the first three of the dimensions outlined above. The magnitude of the C factor also determines the speed that a distribution business needs to adjust its performance to bring it in line with average industry performance.
- 122 The dimension not explicitly covered by these component factors is the quality dimension. The Commission considers that the analysis performed to date on price/quality trade-offs is not sufficiently robust for the purposes of taking account of this dimension in setting the parameters of a price path threshold. For the regulatory period beginning in 2004, the quality dimension will be taken into

account through the quality threshold alone. However, the Commission intends to continue investigating the relationship between price and quality, with a view to more explicitly incorporating price/quality trade-offs into the thresholds for the next regulatory period.

- 123 Although the trade-off between price and quality has not been able to be fully integrated into the price path threshold, the thresholds have been set by the Commission so that businesses still have sufficient scope to manage this trade-off for themselves, and to undertake investments needed to provide service at the level of quality demanded by consumers.

B factor

- 124 As described in more detail in the section on industry-wide performance (from paragraph 173 below), the Commission has used total factor productivity (TFP) analysis to inform its decisions on setting the B factor. The Commission has decided that the appropriate level of the B factor for all distribution businesses is 1%.
- 125 The B factor will apply equally to all distribution businesses for the entire five-year regulatory period. Setting a B factor places incentives on distribution businesses so that average industry productivity improves over the regulatory period.

C factors

- 126 The Commission has used a two-stage approach to set the C factors for distribution businesses. The methodology used to determine the C factors is described in more detail in the section on relative distribution business performance (starting at paragraph 243 below).
- 127 In the first stage, multilateral TFP analysis (an extension of the TFP index approach used in deriving the B factor) is applied to allocate distribution businesses to three groups, based on their relative cost efficiency (i.e. productivity). C_1 factors of either -1%, 0% or 1% are assigned to the three groups of businesses. Businesses in the group performing near the industry average, in terms of their relative productivity (taking their customer and energy density characteristics into account), receive a C_1 factor of zero. Those businesses achieving higher productivity levels are assigned a C_1 factor of negative 1%. Businesses achieving low productivity levels are assigned a positive C_1 factor of 1%.
- 128 In the second stage, distribution businesses are allocated to a further three groups based on relative profitability, measured by calculating post-tax 'residual' rates of return. C_2 factors of either -1%, 0% or 1% are assigned to these three groups of businesses. Those businesses that have been consistently achieving relatively low rates of return have been assigned a C_2 factor of negative 1%. Businesses achieving relatively high rates of return have been assigned a positive C_2 factor of 1%. The remaining businesses are assigned a C_2 factor of zero.

Incentive effects of the C factor components

- 129 The productivity component of the C factor (i.e. the C₁ factor) aims to bring distribution businesses with relatively lower productivity in line with the improving industry average implied by the B factor over two regulatory periods (i.e. ten years). Better performing businesses will still face incentives to make efficiency improvements each year to avoid breaching the price path threshold. However, these businesses will be able to retain relatively more of the benefits of any efficiency gains that they can make over the regulatory period.
- 130 The profitability component of the C factor (i.e. the C₂ factor) acknowledges that, while some businesses have more scope for reducing prices and sharing efficiency gains with consumers over the long term, other businesses have been consistently maintaining low prices. Adjustments reflecting relative profitability are applied to ensure that excessive profits are constrained, but not to an extent that might discourage future efficiency gains. Conversely, assigning a negative C₂ factor to businesses with relatively low residual rates of return is consistent with the long-term benefit of consumers.
- 131 The majority of distribution businesses and their expert advisers gave in principle support to deriving X factors from the combination of a common B factor, derived from TFP analysis, and a C factor based on an analysis of relative business productivity (i.e. the C₁ factor). For instance, Benchmark Economics (on behalf of Powerco) stated that implementing the comparative option through a two-part industry-based productivity factor aligns with best practice in regulatory pricing. From the perspective of consumers, MEUG also generally endorsed the Commission's approach to deriving B and C₁ factors.¹⁵
- 132 On the other hand, interested parties expressed concerns regarding the likely magnitude of the B and C₁ factors, as well as regarding the assumptions underpinning the analysis used to determine them (discussed in later sections of this paper).
- 133 In addition, many distribution businesses disagreed with the concept of the C₂ factor, considering the inclusion of a profitability component in the C factor as akin to a profit threshold, and potentially providing poor incentives for dynamic efficiency. Many indicated that they considered the major advantage of using a comparative approach to setting the price path threshold will be lost by a focus on profits and costs rather than on prices and quality.
- 134 On the other hand, MEUG submitted that the C₂ factor is an appropriate concept for a threshold, and warned that abandoning the C₂ factor, as many distribution businesses have proposed, would provide no way to ensure businesses are limited in their ability to extract excessive profits, as is required by the Purpose Statement of Part 4A of the Act.¹⁶

¹⁵ Benchmark Economics, *Submission to New Zealand Commerce Commission, Regulation of Electricity Lines Businesses, Targeted Control Regime, Draft Decisions, Prepared by Benchmark Economics on Behalf of Powerco Limited*, 20 October 2003, p 4; MEUG, *Cross-Submission on Commerce Commission Conference "Draft Decisions: Resetting the Price Path Threshold"*, 19 November 2003, p 1.

¹⁶ *ibid* p 2.

- 135 The Commission considers that, in combination, the two components of the C factor reflect that a distribution business earning relatively high returns can sustain a higher level of real price reductions than that indicated solely by its relative productivity performance. Conversely, if a business is earning relatively low returns then there is an arguable case for easing the tightness of its price path threshold based purely on productivity considerations. The profitability component cannot be compared to a profit threshold, because businesses which exceed the efficiency gains implied by the price path, will be able to retain benefits (i.e. profits) over and above those shared with consumers, an outcome consistent with the Purpose Statement.

Incentive effects of the overall X factors

- 136 The C₁ and C₂ factors are added together to provide the combined C factor. Following the analysis of relative distribution business performance, no business has been found to exhibit both relatively lower productivity and relatively higher profits. However, three businesses have been found to exhibit both relatively higher productivity and relatively lower profits. Therefore, these three businesses have a combined C factor of -2%, whereas all other distribution businesses have combined C factors of -1%, 0% or 1%. Allowing the factors to be combined acknowledges submissions which maintained that the thresholds should not constrain more productive businesses, with below-average returns, from bringing their average prices up to more efficient and sustainable levels.
- 137 The X factors applying to each distribution business are found by adding the common B factor of 1% to the combined C factor for that business. Overall, distribution businesses with below-average productivity, or with more scope to reduce prices, receive a higher X factor. The better performing businesses, or those which have been consistently maintaining low prices, face a lower X factor. However, all businesses still face incentives to make efficiency improvements each year to avoid breaching the price path threshold.
- 138 Lines businesses have urged the Commission to set conservative X factors, given their concerns about the robustness of the methodology used by the Commission to set the B and C factors and the quality of the data underpinning the analysis. The potentially detrimental impact of low prices on dynamic efficiency is highlighted by many businesses, with some also arguing that the lack of an integrated price/quality threshold will deter investments in improved quality.
- 139 On the other hand, MEUG has indicated it favours the Commission erring on the side of having more, rather than less, lines businesses breach the thresholds. While not necessarily expecting that any business would become controlled, MEUG has expressed its support for undertaking inquiries into several lines businesses each year.¹⁷
- 140 The Commission is mindful that improvements in dynamic efficiency for infrastructure industries may be difficult to achieve in the short term, and attempting to rapidly improve productivity could potentially harm consumers in

¹⁷ MEUG, *Comments on Discussion Paper "Resetting the Price Path Threshold"*, 30 June 2003, p. 2.

the long run. Consequently, the maximum value of the X factor is +2%, which acknowledges that the industry is capital intensive with long lived assets. On the other hand, the Commission does not expect that those distribution businesses striving to attain best practice in the provision of distribution services will consider themselves limited to the efficiency gains implied by the X factors assigned to them under the price path threshold.

- 141 Consistent with the Purpose Statement of subpart 1 of Part 4A, the X factors in the price path threshold will provide incentives for the lines businesses to improve efficiency, to share the benefits of efficiency gains with consumers over the long term, including through lower prices (in real terms), and to be limited in their ability to extract excessive profits. Lines businesses will also continue to face incentives to maintain quality of service, including reliability of supply.

Regulatory period

- 142 The Commission has the discretion under section 57G of the Act to reset the thresholds “from time to time” following consultation with interested parties. However, the Commission is mindful that regulatory opportunism, which can occur if regulators arbitrarily overturn previous decisions, can remove value from regulated firms and harm consumers in the long run.
- 143 A number of distribution businesses favoured reset periods from five to ten years. Others considered that, given concerns about the impact of poor data quality on the analysis used to set the X factors, C factors should be reviewed earlier.
- 144 The Commission has considered evidence from other jurisdictions on the appropriate length of time between price path resets. Regulators typically choose five-year periods, and this appears to be designed to strike a reasonable balance between maintaining incentives for firms to improve efficiency and enabling regulators to bring prices back into line with costs in a timely fashion where firms exceed efficiency expectations.

Definition of price and the treatment of rebates and discounts

- 145 Many consumer trust- and consumer cooperative-owned distribution businesses provide rebates or discounts to their consumers, usually on an annual basis. Rebates are effectively a means of returning dividends to the owners of the network, who are also the consumers of the services provided by the business. These distribution businesses typically pay only a small dividend to the trust or cooperative to cover administration expenses. The rest of the funds are distributed directly to the consumer owners (who in some cases are a subset of the entire pool of consumers) through various means.
- 146 Some distribution businesses make the extent of rebates explicit through lump sums paid to consumers. WEL Networks has made the distinction between ‘rebates’ which are determined and distributed to consumers *ex post*, and ‘discounts’, to which distribution businesses commit in advance.¹⁸ Others, in

¹⁸ WEL Networks, *Submission on the Regulation of Electricity Line Businesses, Targeted Control Regime, Draft Decisions on Resetting the Price Path Threshold*, 21 October 2003.

contrast, have lower prices in the first instance, thus earning a rate of return below their cost of capital. In other words, rebates are implicit in the posted prices.

- 147 Applying the price path to such discounted prices could be considered to disadvantage those businesses compared to other distribution businesses. However, PwC (on behalf of 18 distribution businesses) has indicated it favours using posted (i.e. pre-rebate) prices as the basis for notional revenue in the price path threshold.¹⁹
- 148 The Commission points out that the comparative analysis of profitabilities has been undertaken on a pre-rebate (and pre-discount) basis, which is consistent with applying a price path threshold to notional revenue based on posted prices. Such an approach is more equitable given that rebates are not necessarily provided to all consumers served by a trust-owned distribution business on a consistent basis. In addition, those businesses that provide implicit discounts to consumers are more likely to be assigned a negative C₂ factor.
- 149 Finally, should a distribution business prefer to make explicit discounts more permanent, by including them as part of its posted prices, it will be able to do so without affecting its ability to comply with the price path threshold in the future.

Transpower's Price Path Threshold

- 150 Applying a comparative approach to setting Transpower's price path would require international benchmarking. The Commission considers that there is currently insufficient information on which to establish a robust comparative approach for Transpower.
- 151 In addition, given the uncertainties associated with the approach the Electricity Commission will take with respect to Transpower's investment programme, the Commission considers it prudent to reset Transpower's price path threshold for only one year. Greater clarity as to the approach the Electricity Commission will take should be achieved during that time.
- 152 A one year threshold will continue to place incentives on Transpower to improve efficiencies, through the imposition of a B factor, but will not lock in a price path that, over a five-year period, might become inconsistent with decisions made regarding Transpower's investment programme.
- 153 Over the next 12 months, the Commission will consider the appropriate implementation of the targeted control regime for Transpower, in light of decisions made regarding its investment programme, and in consultation with interested parties.

EV adjustments

- 154 Transpower's one year price path will be based on Transpower's prices before adjusting for EV adjustment charges, and therefore any residual (or deficit) in Transpower's EV account will be ignored. The Commission considers that

¹⁹ PwC, *Submission to Commerce Commission, Regulation of Electricity Lines Businesses, Resetting the Price Path Threshold*, 30 June 2003, p 8.

requiring Transpower to repay its EV amounts would only be justified if the Commission could assure Transpower it would be able to earn a normal rate of return on its revalued assets into the future. This assurance is difficult to provide under a price path threshold, given the uncertainties concerning the approach of the Electricity Commission.

- 155 Transpower has agreed with the Commission's approach for setting its price path, supporting a one year price path exclusive of EV adjustment charges. However, Transpower has argued that the EV adjustment charges should be ignored for all future threshold decisions, and not just for the current reset. At this stage, the Commission reserves its position whether to consider EV adjustment charges during a post-breach inquiry, and/or to revisit the issue during future resets of the thresholds.

Threshold compliance

- 156 Despite general agreement with the Commission's decisions, Transpower argued that it should be subject to a revenue path rather than price path. Consequently, in its threshold compliance statement as at 6 September 2003, Transpower invoked clause 5(4) of the Initial Notice used to set the thresholds, and applied a revenue path approach where any revenue from new services is treated as a pass-through item. In justifying its approach, Transpower has explained that the cost of transmission-related services is predominantly recovered through fixed charges, and that its pricing methodology is consistent with the Government's s 26 statement to the Commission.
- 157 The Commission emphasises that the incentives in the price path threshold are as important for Transpower as they are for distribution businesses. Lines businesses cannot elect to use other means to demonstrate compliance with the price path threshold based on a preference to use a different approach. Businesses using a different approach must demonstrate to the Commission's satisfaction that it is not practicable to determine whether that business has complied with the price path threshold as specified in the *Gazette* Notice.

Threshold Options Not Implemented

Price/quality benchmarking

- 158 As noted above, the Commission considers the quality of service demanded by consumers to be one of the possible dimensions that could be taken into account in setting the parameters of a CPI-X price path threshold. Many distribution businesses agreed, expressing a preference for output benchmarking, involving a comparison of relative business price and quality rather than productivity and profitability.
- 159 The Commission assessed whether it is currently feasible to derive C factors on the basis of relative distribution business price efficiencies, taking quality of service into account. Analysis undertaken for the Commission by Meyrick examined the scope to use an econometric price/quality function to identify distribution businesses that appear to have high and low price levels, given their

service quality levels, and after normalising for factors largely outside management control.

- 160 Despite extensive investigation, documented in Meyrick’s Initial Report, the price/quality regressions were found to be sensitive to the specification used and were unable to separately identify the contribution of service quality to price. Moreover, the explanatory power of the models was very poor, unless total cost was included as a variable.²⁰ This result demonstrates the difficulty of realising one of the key apparent advantages of output benchmarking from the perspective of distribution businesses, namely that the Commission need not form judgements regarding the efficient level of business inputs.
- 161 In its Initial Report, Meyrick pointed out that the relationship between service quality and distribution capital and operating costs is relatively complex. It is likely to involve a number of lagged effects relating current costs to both past and future reliability performance. Meyrick also argued that the price/quality approach proposed by many distribution businesses is less defensible in terms of underlying economic theory than benchmarking models which compare distribution business productivity and profitability. In particular, the range of distribution business ownership and governance structures makes understanding the drivers of prices charged somewhat problematic, and reinforces the importance of using productivity and profitability information as the primary basis for determining the thresholds for individual businesses.

Analysis of price/quality benchmarking by distribution businesses

- 162 Aurora developed a series of regression models attempting to explain distribution business price levels in terms of customer density (connections/km), energy density (kWh/connections) and quality (SAIDI). While demonstrating how the approach might be used to derive C factors in future, Aurora conceded that quality must be treated separately at this time. Nevertheless, Aurora urged the Commission to continue investigating an integrated price/quality threshold, and not to wait five years before introducing it.²¹
- 163 Vector presented both cost and price/quality regression models in terms of customer density and energy density.²² Vector proposed using ‘deadbands’ of price/quality positions to account for data inaccuracies, the use of a small number of cost drivers, the use of only a single (and volatile) measure of quality, and other factors such as the effect of rebates and discounts. Distribution businesses within the deadband would only breach the price/quality threshold if real prices rise above their starting position, or if quality deteriorates to a position above the deadband. Businesses below the deadband would breach if real prices rise above the starting position (unless these changes were consistent on an annual basis with a ‘migration plan’ justifying price/quality trade-offs from a customer perspective), or if the price/quality position moves above the deadband’s lower bound.

²⁰ Meyrick, September 2003, above n 5, Section 8.5.

²¹ Aurora Energy, *Submission to the Commerce Commission by Aurora Energy Ltd re Electricity Lines Business Thresholds*, “Resetting the Price Path Threshold”, 20 October 2003, p 6.

²² Vector, *Submission to the Commerce Commission’s Discussion Paper – Resetting the Price Path Threshold*, 30 June 2003, pp 25-42.

Businesses above the deadband would need to migrate to within the deadband in five years, according to the annual price/quality targets in the migration plan.²³

- 164 The assumption that relative price/quality performance assessments can reveal inefficiencies and/or excessive profits is an attractive one. However, the Commission considers the analysis of price/quality trade-offs undertaken by Meyrick, as well as by distribution businesses, highlights that the currently available information on the relationship between prices and quality of service is limited. This makes it difficult to incorporate price/quality trade-offs into a price path threshold in a manner that fully addresses the objectives for quality set out in the Purpose Statement of subpart 1 of Part 4A.
- 165 In its further development of the information disclosure regime under subpart 3 of Part 4A, the Commission intends enhancing the scope and specifications of data relating to distribution service quality. In addition, the Commission intends conducting further analysis on the feasibility of devising a robust price/quality trade-off framework that could possibly be implemented in the next regulatory period. Lessons learned from annual assessments of distribution businesses against the reliability and consumer engagement criteria, coupled with expanded information disclosure requirements, may also allow a more comprehensive quality threshold to be developed at that stage.

Building blocks approaches

- 166 Orion acknowledged that bringing quality into any comparative performance assessment of distribution businesses is challenging. However, Orion argued that a building blocks approach provides the most straightforward way of taking quality into account. Orion has consistently expressed its preference for using such an approach to set the price path threshold. A one-off profitability adjustment would be made for each business (possibly implemented over time, rather than entirely at the beginning of the regulatory period), and then a common X factor would apply to all distribution businesses.²⁴
- 167 In support of Orion's position, NERA argued that there are no grounds for determining differential C factors, unless there are reasons to believe that differently situated distribution businesses face different competitive energy market constraints. Furthermore, business-specific X factors will not provide incentives for improved efficiency, likely leading to gaming by businesses of the disclosure indicators used to derive the C factors. This viewpoint contrasted with Aurora's submission, which suggested that the relationship between C₁ factor rankings and key cost drivers is unclear or counterintuitive, making it difficult for businesses to understand what they need to do to improve performance.²⁵
- 168 Despite being based on relative cost efficiencies and profitabilities rather than price efficiencies, the Commission considers that its comparative approach for

²³ *ibid* pp 10-12.

²⁴ Orion, *Regulation of Electricity Lines Businesses, Targeted Control Regime, Draft Decisions – Resetting the Price Path Threshold, Submission by Orion*, 20 October 2003, p 4.

²⁵ NERA, *Unacceptable Electricity Distribution Productivity Measures for Resetting the Price Path Threshold, Prepared for Orion New Zealand Limited*, 20 October 2003, p 6; Aurora, October 2003, above n 21, p 33.

setting the price path threshold provides better incentives for efficiency gains than an approach based on building blocks. Relatively more efficient distribution businesses would be penalised under a building blocks approach, given that under Orion and NERA's proposed approach prices would be realigned to actual rather than to efficient costs. On the other hand, undertaking an in-depth assessment of business-specific efficient costs would be inconsistent with the principle that the threshold should not act as a form of control.

Frontier analysis

- 169 The Commission also considered whether a frontier-based comparative analysis might be more appropriate than the average-based approach that has been used. To date, frontier methods have only had limited success when applied to regulating utilities. In its Initial Report, Meyrick expressed the view that frontier approaches are more sensitive to data errors and can lead to unachievable X factor targets being set. Given the quality of relevant data for New Zealand lines businesses, Meyrick argued that using an average estimation approach is likely to be more appropriate and minimise the impact of data errors and omissions.²⁶ Such views were echoed at the conference by CRA (on behalf of Vector), and assessing average rather than frontier performance was consistently preferred by distribution businesses.
- 170 Given the sensitivity of a frontier approach to outliers in the presence of poor data quality, the Commission considers that it is prudent to reset the price path threshold for the regulatory period beginning in 2004 on the basis of average rather than frontier performance.

'Outlier' approaches

- 171 Unison suggested that a price path threshold based on comparative performance would provide poor incentives for businesses to operate consistently with the regime's objectives, and could even preclude businesses from undertaking efficient investments to improve service quality. Instead, benchmarking should be used without a price path, to identify those businesses with the highest prices relative to the quality of service provided. The use of multiple analytical tests would give more credibility to this process of screening for outliers.²⁷
- 172 The Commission considers that 'outlier' approaches, along with methods which provide distribution businesses with substantial discretion within broad deadbands (such as Vector's proposed approach described above), would not provide significant incentives for the majority of businesses to improve and share efficiencies in a manner consistent with the Purpose Statement of subpart 1 of Part 4A. While there will always be the possibility that certain unique business-specific circumstances cannot be fully reflected in a price path threshold, such circumstances can be taken into account by the Commission during the course of a post-breach inquiry.

²⁶ Meyrick, September 2003, above n 5, Section 5.6.

²⁷ Unison/NECG, *Resetting the Price Path Threshold, Response to the Commission's Discussion Paper by Unison and Network Economics Consulting Group*, 30 June 2003, pp 20-22.

INDUSTRY-WIDE PERFORMANCE (B FACTORS)

173 This section outlines the Commission's approach to setting the B factors for distribution businesses and Transpower, in light of the analysis of industry-wide productivity undertaken for the Commission by Meyrick, and taking into account relevant submissions from interested parties.

Methodology for Determining the B Factors

Total factor productivity analysis

174 As discussed above (paragraph 108), a CPI-X price path provides incentives for a lines business to set its output prices so that they track the level of estimated efficient unit costs for the industry as a whole. Regulators in many jurisdictions (including Australia, the US, the UK and Canada) use total factor productivity (TFP) analysis to inform them in their decisions on an appropriate level for the common X factor to set in a CPI-X price control regime. 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.²⁸

175 To derive the common X factor requires taking into account the difference between the TFP performance of the industry and the economy, and between industry- and economy-wide input price growth rates. Therefore, the B factor in the price path threshold has been estimated by the following expression.²⁹

$$B = (\Delta TFP - \Delta TFP_E) - (\Delta W - \Delta W_E)$$

where:

ΔTFP is the industry-wide trend TFP growth rate;

ΔTFP_E is the economy-wide trend TFP growth rate;

ΔW is the change in economy-wide input prices; and

ΔW_E is the change in industry-wide input prices.

176 Interested parties generally acknowledged that TFP is a well-established methodology for deriving industry-wide productivity measures. Key issues raised by submitters in regard to the Commission's approach to determining the B factor did not generally relate to the methodology itself, but to the assumption that past performance is a good guide to the potential for future efficiency gains, and to the choice of inputs and outputs used in the TFP analysis (and in the multilateral TFP analysis used to derive to C₁ factors).

177 Lines businesses also maintained that concerns relating to the quality of the underlying information disclosure data used in the analysis warranted a conservative approach to determining industry-wide TFP. In addition, businesses

²⁸ Meyrick, December 2003, above n 7, Section 2.

²⁹ For example, Jeff Makhholm and Michael Quinn, *Price Cap Plans for Electricity Distribution Companies Using TFP Analysis*, NERA Working Paper, 21 October 1997, p 6.

raised a number of questions regarding the appropriate assumptions to make in determining the other components making up the overall B factor.

Past performance as a guide for the future

- 178 Meyrick has pointed out that a key question is whether past productivity performance can act as a reasonable guide as to what is achievable in the future. Meyrick suggested there are two situations where past productivity performance may not be a good guide to future performance.³⁰
- 179 The first of these is where a major change occurs in the form of regulation, with the new regulatory regime offering more powerful incentives for the firm to improve performance.³¹ However, since New Zealand lines businesses have been subject to ongoing reforms for the past several years, Meyrick considered it is less likely there could be a step increase in average productivity performance going forward to the reset threshold.
- 180 The second situation where past performance may not be a good guide to future performance is where the industry as a whole nears feasible best practice. Given that New Zealand lines businesses have only recently acquired a separate identity and a more commercial focus, Meyrick argued it is unlikely that many (if any) are sufficiently close to best practice that feasible future productivity growth will be significantly less than that achieved in the past.
- 181 The Commission was provided with a range of evidence from distribution businesses regarding the industry's performance relative to international best practice and the ability of distribution businesses to replicate past efficiency gains. For instance, Aurora submitted that, because TFP analysis assumes capital expenditure is relatively stable over time, there is a high likelihood businesses requiring new investment within the regulatory period will breach the threshold or fail to invest.³² The period since 1995 is generally not viewed by distribution businesses as being a good guide to their future performance, and various reasons have been provided as to why forward-looking costs are set to increase.
- 182 A number of distribution businesses claimed that their performance was on par with international best practice. Others suggested that, while there was room left for some distribution businesses to reach the levels of efficiency exhibited by their international peers, efficiency gains could only be realised over time and after substantial investments in more up-to-date network equipment and information technology. It was also claimed that, to date, institutional reforms have caused much demand growth to be met through improved utilisation of existing capacity, yet consumers are beginning to demand more in terms of service quality. Finally, others argued that, given the capital intensive nature of the industry, the majority of network costs are non-controllable.
- 183 The Commission considers that, on balance, the evidence points to considerable performance differences between distribution businesses, and suggests that further efficiency gains are likely to be achievable through the ongoing rationalisation of

³⁰ Meyrick, December 2003, above n 7, Section 2.1.

³¹ For example, Makhholm and Quinn, above n 29, p 4.

³² Aurora, October 2003, above n 21, p 17.

the industry. The differences between businesses also indicate that the Commission's approach of using a C factor to supplement the B factor during the regulatory period starting in 2004 is an appropriate way to recognise that not all businesses have the same potential for realising future efficiency gains. In addition, recognising that distribution businesses with below-average performance may not be able to improve productivity rapidly, the Commission has taken the realistic approach of setting C₁ factor values consistent with bringing businesses with relatively lower productivity into line over a ten-year period.

Defining inputs and outputs

- 184 TFP indexes have been the most common technique used 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 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 and cost shares, respectively. Changes in the TFP index indicate how the amount of total output that can be produced from a unit of total input has changed over time.³³
- 185 Therefore, a key challenge in calculating TFP for the distribution and transmission industry is the specification of lines business outputs, and the measurement of the quantity and value of each of those outputs. Early studies of electricity supply productivity measured output by system 'throughput' (i.e. delivered energy) alone. However, Meyrick has argued that, as for all network infrastructure industries, this simple measure ignores that a major part of lines business output is providing the capacity to supply the product. Other outputs that distribution businesses provide are directly related to their number of customers (or connections).³⁴
- 186 Indexes can be constructed directly using physical quantities or indirectly using constant dollar measures of the input and output quantities. Given relatively higher concerns about the quality of disclosed financial indicators, Meyrick's analysis took the direct approach.
- 187 The distribution productivity analyses reported by Meyrick in relation to industry-wide performance (i.e. B factor), as well to relative business performance (i.e. C factors), have contained three outputs. The three output quantities Meyrick has considered applicable for distribution businesses are energy delivered (also termed 'throughput') measured in kWh, system capacity measured in MVA-km, and connections.
- 188 These diverse outputs need to be combined into an aggregate output index by allocating a weight to each output. For most industries which produce multiple outputs these output weights are taken to be the revenue shares. However, for distribution businesses, separate amounts being paid for the different outputs

³³ Meyrick, December 2003, above n 7, Section 2.

³⁴ *ibid* Section 4.2.

cannot be observed. Therefore, Meyrick weighted the revenue shares based on the estimated output cost shares derived from an econometric distribution cost function using a distinct technology for each distribution business.³⁵

- 189 Meyrick has considered five input quantities to be applicable for distribution businesses: 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 (derived from disclosed direct and indirect expenditure, deflated by an industry labour cost index), and a percentage of disclosed distribution business optimised deprival value (ODV), reflecting depreciation and return on investment. Cost shares for the input quantities were then weighted by disaggregated ODV data averaged across four groups of businesses, classified as urban or rural, or as having high or low energy density.³⁶
- 190 Information disclosure requirements under the Regulations have been somewhat different for Transpower. Therefore, Meyrick selected slightly different inputs and outputs to evaluate transmission TFP, and trend TFP growth rates for distribution and transmission have been determined separately. Meyrick has defined transmission outputs to be energy delivered and system capacity, and inputs to be (deflated) operating expenses, lines capital and transformer capital.
- 191 A number of distribution businesses disagreed with Meyrick's choice of inputs and outputs. In particular, businesses highlighted the dependence of both outputs and inputs on a measure of system capacity, and the potentially distorting impact of distinguishing between overhead and underground capacity. However, although proposing some refinements, CRA (on behalf of Vector) stated that Meyrick's selection of inputs and outputs appears reasonable, particularly at an aggregate level.³⁷
- 192 PEG (on behalf of Powerco) recommended using financial-based data rather than physical-based data to derive the input indexes. However, such an approach would be heavily reliant on the data series for lines business optimised deprival value (ODV). Given the impact of revaluations on disclosed ODVs, the Commission has less confidence in using the fluctuating ODV data than in the more stable disclosed physical quantities.
- 193 While a number of distribution businesses suggested that quality should be considered a distribution output for the purposes of TFP analysis, in its Initial Report, Meyrick explained that in practice this is very difficult to implement.³⁸ Aurora attempted to demonstrate how Meyrick's analysis could be modified to include SAIDI as a distribution business output (although this was in the context

³⁵ Meyrick, September 2003, above n 5, Section 8.4; Meyrick, December 2003, above n 7, Sections 4.2 and 4.3.

³⁶ The term 'rural' is used by Meyrick (ibid Section 6.2) to refer to distribution businesses with customer densities of less than 13 connections/km. 'High' energy densities are used to refer to those businesses with an average consumption of 0.016 GWh/connection.

³⁷ For example, Aurora, October 2003, above n 21, p 21; CRA, *Resetting the Price Path Threshold – Comparative Option: Review of Meyrick and Associates Report, Submitted to Vector Networks*, 20 October 2003, pp 19-20.

³⁸ Meyrick, September 2003, above n 5, Section 5.1.

of the multilateral TFP analysis used to derive the C_1 factor).³⁹ The Commission notes that, given quality has improved on average across the industry in the last few years, a TFP analysis that excludes quality would tend to understate productivity growth, and therefore be a conservative estimate. The Commission concludes that no credible alternative to Meyrick's choice of inputs and outputs has been presented.

Voltage conversion factors

- 194 Benchmark Economics (on behalf of Powerco) considered the approach outlined in Meyrick's Initial Report of using the summed product of line length and an MVA factor (i.e. MVA-km) to be an acceptable way of incorporating the multi-dimensional nature of distribution network output. However, like a number of distribution businesses, Benchmark Economics questioned whether the voltage conversion factors used in Meyrick's Initial Report to derive the MVA-km system capacity term were applicable to New Zealand conditions, appropriately disaggregated by voltage level, and sufficiently accounted for different operating conditions. The Commission engaged Parsons Brinckerhoff Associates (PBA) to address these issues. PBA's review of the voltage conversion factors recommended making some minor revisions to the factors to account for New Zealand conditions, and proposed distinct factors for voltage levels previously banded together and assigned the same factor.⁴⁰
- 195 Despite PBA's review, Vector maintained that the MVA-km term is a poor measure of the output demanded by consumers generally. In terms of the technical approach for deriving the measure, Vector considered the conversion factors to be too broad-banded, given the diverse operating conditions and security criteria applicable to different voltage levels.⁴¹
- 196 PwC (on behalf of 18 distribution businesses) and Counties Power have acknowledged PBA's voltage conversion factors as being a significant improvement over the factors used in Meyrick's Initial Report. However, it is noted that, at a given voltage level, disaggregated factors would better account for differences between urban and rural conditions, and for different categories of conductor. Nevertheless, PwC noted that the averaging approach proposed by PBA reflects the extent to which conductor information is currently disaggregated in the information disclosure data.⁴²
- 197 Meyrick reviewed PBA's analysis and agreed PBA's values are more appropriate than the conversion factors in the Initial Report.⁴³ The Commission considers that PBA's voltage conversion factors currently provide the best available approach to deriving the MVA-km terms for the TFP (and MTFP analysis).

³⁹ Aurora, October 2003, above n 21, pp 36-37.

⁴⁰ PBA, *Review of Voltage Conversion Factors to Develop MVA-km Output Term for Total Productivity Analysis, Prepared for the Commerce Commission*, 10 November 2003.

⁴¹ Vector, *Price Path Reset Cross Submission*, 19 November 2003, Annex B.

⁴² PwC, *Cross Submission to Commerce Commission, Regulation of Electricity Line Businesses, Draft Decisions, Resetting the Price Path Threshold*, 19 November 2003, p 8; Counties Power, *Review of Voltage Conversion Factors*, 19 November 2003, p 1.

⁴³ Meyrick, December 2003, above n 7, Section 4.3.

Analysis of Overall Distribution Business Productivity

Initial database used

- 198 In developing appropriate models of lines business performance for its Initial Report, Meyrick created its own database of relevant lines business data. The primary data sources for Meyrick's initial analysis were the revised information disclosure datasets provided by the MED for the period 1995-2002 (paragraph 16), and also other information disclosure data published in the *Gazette* for the same period.
- 199 Given what seemed to be a high level of data consistency problems for 1995, Meyrick excluded that year's disclosure data from this initial database. Meyrick also took into account most of the comments that were received from interested parties on the MED datasets. However, at that stage, Meyrick did not make ad hoc changes to the data to correct other apparent anomalies, given that interested parties had a further opportunity to make submissions on the database following the release of the Draft Decisions.⁴⁴

Initial analysis of industry-wide performance (1996-2002)

- 200 In its initial analysis, Meyrick used the Fisher TFP index method to calculate the productivity performance of the electricity distribution and transmission industry. As noted above, distribution and transmission TFP were determined separately, given that the same inputs and outputs could not be defined for Transpower and the distribution businesses.⁴⁵
- 201 Before determining the TFP indexes, Meyrick used an econometric cost function to estimate the weighted average output cost shares for the distribution industry. For the 1996-2002 period, these shares were found to be 18% for energy, 34% for system capacity and 48% for connections.⁴⁶ These relative shares appeared reasonable in light of submissions suggesting capacity is a more appropriate measure of distribution business output than energy, as well as with previous studies that have highlighted the importance of energy density, and not just customer density, as a key distribution cost driver.
- 202 Meyrick's initial analysis found the base case value for the B factor applicable to distribution businesses to be 2.6%, comprising: the difference between the TFP trend rate for the electricity distribution industry (3.2%) and for the New Zealand economy (1.1%); less the difference between input price growth trends in the electricity distribution sector (1.4%) and in the economy (1.9%). For input prices, Meyrick used the difference between the labour cost indexes for the electricity, gas and water sectors, and for the market sector, given the relative stability of these series.⁴⁷

⁴⁴ Meyrick, September 2003, above n 5, Section 6.

⁴⁵ *ibid* Section 7.1.

⁴⁶ *ibid* Section 8.4.

⁴⁷ *ibid* Sections 3.1, 7.2 and 7.4.

Quality of the information disclosure data

- 203 Despite having made submissions to correct the database used in Meyrick's analysis of industry-wide (and relative) distribution business performance, many businesses raised a number of additional general and specific concerns regarding the poor quality of the information disclosure data in the initial database. Businesses also highlighted that the data were never intended to be used for comparative performance analysis.
- 204 A number of distribution businesses noted that, while the overall quality was poor, the changes in reporting requirements from the 1994 to the 1999 Regulations significantly improved the consistency of subsequently disclosed data. As such, some businesses recommended only using data disclosed under the revised Regulations.
- 205 The Commission considers that, compared to the analysis of industry-wide performance, the relative distribution performance analysis (used to determine the C factors) is more sensitive to any inconsistencies in the way that the disclosure data has been reported. Therefore, the Commission considers it appropriate to ignore pre-1999 disclosure data for the purposes of any comparative analysis. However, for the industry-wide analysis, the Commission agrees with Benchmark Economics that, with the exception of the effect of the separation of lines and retail businesses, the aggregation of data in the industry-wide analysis used to determine the B factor tends to average out many of the data imperfections.⁴⁸ Furthermore, a longer data series is preferable for deriving the distribution TFP trend rate. Hence, all eight years of data from 1996 to 2003 have been used in Meyrick's updated analysis of distribution TFP.

Auckland CBD outage

- 206 In its Initial Report, Meyrick argued that the Auckland CBD outage was an abnormal event that should be excluded from the distribution TFP analysis. To determine what impact the supply failure had on distribution productivity, Meyrick recalculated TFP for all distributors excluding Vector. Although this produced a smoother TFP series, it only changed the TFP trend rate by 0.1%.⁴⁹
- 207 In its Final Report, rather than exclude Vector as a whole from the analysis (particularly given Vector's significant share of the distribution services market), Meyrick has explicitly smoothed Vector's indirect operating expenditure for the likely impact of the Auckland CBD outage.⁵⁰

Separation of lines and retail businesses

- 208 A key issue raised by many distribution businesses related to the possible effect that the separation of electricity lines and retailing businesses had on the integrity of the information disclosure data. At the time that the lines and retail businesses separated, the Regulations were changed to require all lines businesses to use the avoidable cost allocation methodology (ACAM). In particular, distribution

⁴⁸ Benchmark Economics, October 2003, above n 15, pp 5 and 12.

⁴⁹ Meyrick, September 2003, above n 5, Section 7.2.

⁵⁰ Meyrick, December 2003, above n 7, Section 4.3.

businesses highlighted many apparent discontinuities in the operating expenditure data disclosed by many businesses between 1998 and 1999. Distribution businesses argued that this separation, and the concurrent change in cost allocation rules, combined to produce a one-off event which, like the Auckland CBD outage, should be explicitly taken into account in the distribution TFP analysis.

- 209 Not all distribution businesses appear to exhibit a discontinuity in their disclosed operating expenditure at that time. Of those that do, Orion appears to have been the largest single contributor to the industry-wide discontinuity. Orion presented specific evidence to the Commission estimating the amount by which its pre-1999 disclosures had overstated the operating expenditure attributable to distribution services. Orion has provided revised operating costs for 1996-1998, prepared on a consistent cost allocation basis with expenditures disclosed for 1999-2003, and reviewed by Audit New Zealand.⁵¹ Meyrick's updated analysis has used these revised operating expenditure values, which reduce Orion's distribution business costs by between \$14.5 and 16.6 million per annum prior to 1999.
- 210 Meyrick's Initial Report presented the results of a sensitivity analysis to estimate the effect of the separation of lines and retail businesses on distribution TFP growth. Projecting the TFP change between 1997 and 1998 forward for the change between 1998 and 1999 was found to reduce the distribution TFP trend growth rate from 3.2% per annum to 2.6%.⁵²

Economy-wide TFP

- 211 PEG was the only interested party to raise any issues concerning Meyrick's estimate of economy-wide TFP growth. PEG suggested that a value of 1.5% was more appropriate than Meyrick's estimate of 1.1%. Firstly, PEG stated that earlier work undertaken by the same expert had suggested a value of 1.3% was more appropriate. Secondly, PEG argued that the treatment of service sectors in TFP analysis tends to systematically underestimate economy-wide TFP growth. PEG recommended that the estimate of economy-wide TFP be adjusted upward by 0.2% to account for this bias.⁵³
- 212 Meyrick has indicated that the apparent inconsistency with the earlier analysis was due to a lack of clarity in the labelling of the databases used to derive the economy-wide trend TFP growth rates. As to the treatment of service sectors, the Commission considers that any estimate of the associated bias is likely to be imperfect. Given the uncertainty inherent in making such an estimate, the Commission considers that Meyrick's initial recommendation on the appropriate value for economy-wide TFP growth is currently the best available estimate for the purposes of deriving a B factor.

⁵¹ Orion, *Cross-Submission – Price Path Reset Threshold Conference, 3-6 November 2003*, 20 November 2003, pp 2-3; Audit New Zealand, *Review of Avoidable Cost Allocation Methodologies and Models*, Letter to Orion New Zealand Ltd., 18 November 2003.

⁵² Meyrick, September 2003, above n 5, Section 7.2.

⁵³ PEG, *Resetting the Price Path Threshold: Evaluation of the Proposed B Factor*, October 2003, pp 23-27.

Input price differential

- 213 Distribution businesses disagreed with Meyrick's approach in the Initial Report to determining the input price differential, stating that it implicitly assumed the difference between sectoral and economy-wide labour costs will be sustained over the regulatory period, and ignored the significance of capital inputs for electricity distribution.
- 214 Anecdotal evidence was presented by distribution businesses that a shortage of skilled linesmen was becoming an increasing problem. Businesses claimed that this had begun, and would continue, to place upward pressure on distribution service costs. However, the Commission notes that this evidence should be contrasted with recent reports that skilled labour shortages are emerging across the economy as a whole. Nevertheless, some commercial in confidence information was submitted to the Commission which tended to support the argument that, in at least some cases, contracting costs tend to track economy-wide changes in labour prices.
- 215 PwC referred to a 2003 report prepared for the Electricity Supply Industry Training Organisation (ESITO) which pointed to a burgeoning skills gap in the industry, and found that the Asset Management Plans prepared by distribution businesses in 2002 underestimated asset maintenance costs and capital expenditure by around 20%.⁵⁴
- 216 The Commission notes that much of this information would have been evident to distribution businesses during the preparation of their most recent asset management plans. Nevertheless, many distribution businesses still projected capital and operating costs to remain constant or decline in real terms over the regulatory period.
- 217 PEG argued that unless there is clear evidence to support a different trend in input prices in the distribution industry from that in the economy, then the input price differential should be set to zero.⁵⁵ However, CRA submitted that the capital goods price index for power lines construction is the most appropriate input price index to use in deriving the B factor. Although this series exhibits an unexplained large upward step in 1999, CRA argued that any apparent 'steps' or discontinuities in the index should be taken at face value, and adjustments only made if the sources of such discontinuities can be clearly identified and explained.⁵⁶
- 218 In its Final Report, Meyrick has examined the capital goods and producer price indexes relevant to electricity distribution and transmission, but concluded that the evidence from these series is conflicting. Although the power lines construction index tends to support the view that input prices for electricity distribution are

⁵⁴ PwC, November 2003, above n 42, pp 3-7.

⁵⁵ PEG, October 2003, above n 53, p 30.

⁵⁶ CRA, October 2003, above n 37, pp 26-29; CRA, *Cross Submission: Resetting the Price Path Threshold*, November 2003, p 5.

increasing at a greater rate than those in the wider economy, some of the other relevant series suggest the opposite.⁵⁷

- 219 Meyrick has also derived the implicit total price index associated with the distribution industry from the TFP calculations. The trend growth rate in the implicit total price index was found to be around 1%, well below the trend growth rates for the labour price index and the producer price index for all industries, but about the same as the all industries capital price index. This result would tend to support a positive input price differential.⁵⁸

Alternative estimates of the B factor

- 220 A number of interested parties provided their own estimates of the B factor. PwC considered that adjusting for the separation of lines and retail businesses would give a B factor of around 1.5%. However, PwC suggested that there is no reason to assume the future industry labour input price will fall annually by 0.5% relative to the general economy labour price, and therefore a B factor of 1% would be more appropriate.⁵⁹
- 221 PEG calculated the B factor to be 0.7%, based on a TFP trend for the distribution industry of 2.2%, a 1.5% trend for New Zealand's overall economy, and an input price differential of zero. Like NERA, PEG suggested that it is more appropriate to measure TFP as the logarithmic growth rate between the two end points of the TFP index series, rather than to use the regression-based method employed by Meyrick.⁶⁰ The Commission considers that, while PEG's proposed approach is common practice in the US where much longer data series are available for determining TFP indexes, Meyrick's method is more appropriate for dealing with a shorter series based on underlying data of variable quality.
- 222 Aurora re-estimated TFP after smoothing out some of the apparent anomalies in the database, thereby reducing the TFP trend rate for distribution from 3.2% to 2.6%. Taking the analysis a step further, Aurora attempted to correct for the separation of lines and retail businesses by assuming no change in the distribution business input index in 1999 and 2000. Keeping other components of the B factor constant, Aurora concluded that the B factor should be 0.97%.⁶¹
- 223 CRA calculated the B factor as -0.3%, with a possible upper bound of +0.3%. This value was based on a trend rate of TFP growth for the distribution industry of 1.8%. Although not disputing Meyrick's estimate for economy-wide TFP growth, as noted above, CRA argued that the input price differential should be derived from the difference between the capital goods price index for the transmission and distribution sectors (cited as 2.8% per annum for the past nine years) and the PPI

⁵⁷ Meyrick, December 2003, above n 7, Section 5.4.

⁵⁸ *ibid.*

⁵⁹ PwC, *Submission to the Commerce Commission, Regulation of Electricity Lines Businesses, Draft Decisions, Resetting the Price Path Threshold*, 20 October 2003, p 8.

⁶⁰ PEG, October 2003, above n 53, p 2, and pp 15-16; NERA, October 2003, above n 25, pp 17-18.

⁶¹ Aurora, October 2003, above n 21, p 28.

index for the economy (at 1.8%). Vector recommended that the B factor be set between CRA's and PEG's estimates, at around 0.3% to 0.4%.⁶²

International studies of distribution TFP

- 224 NERA (on behalf of Orion) argued that, in the absence of high quality and long term performance data from New Zealand, performance trends from the United States provide the best indicator of possible distribution business productivity gains.⁶³ However, NERA stated that its 1997 estimates of US distributor TFP (which ranged from 0.96% to 2.76% for distributors in different regions of the US over the 1972 to 1994 period) were now obsolete, and that it would not be correct to draw on the relative dispersion between these numbers associated with different parts of the US. Rather, NERA suggested that the Commission should take into account more recent studies of distributors in the Western and Northeast US that suggest TFP growth rates of 0.72% and 0.78%, respectively.⁶⁴
- 225 Benchmark Economics cited Ontario as setting an X factor of 0.86-1.25% over 10 years. CRA cited US and Canadian distribution businesses as having TFP growth rates ranging from 0.5% to 1.5%. However, while NERA placed much weight on TFP data from the US distribution industry, in justifying its negative B factor of -0.3%, CRA stated that there is no economic reason for X factors applied in other jurisdictions to be the same as that applied in New Zealand, particularly given relative differences in the economy and in input prices.⁶⁵
- 226 The Commission considers that despite concerns regarding the underlying quality of the disclosure data, Meyrick's estimation of distribution TFP, based on data specific to New Zealand's distribution businesses, is sufficiently robust for the purposes of setting a threshold.

Database used for the updated distribution TFP analysis

- 227 For its updated analysis of industry-wide distribution TFP, Meyrick incorporated relevant 2003 disclosure data into its distribution business database. As with the data from earlier years, the 2003 disclosure data was provided by the MED in electronic format, following their review of the data.
- 228 For the 2003 disclosure year, Marlborough Lines presented consolidated results for itself and OtagoNet (previously Otago Power), given its 51% share in OtagoNet. Because Marlborough Lines and OtagoNet are still distinct lines businesses for the purposes of the thresholds, the Commission requested Marlborough Lines to provide relevant disaggregated 2003 data for the two businesses. This disaggregated data has been included in Meyrick's updated database.

⁶² CRA, October 2003, above n 37, pp 28-29; Vector, *Submission on Commerce Commission Draft Decisions for Resetting the Price Path Thresholds*, 20 October 2003, p 17.

⁶³ NERA, October 2003, above n 25, p 5.

⁶⁴ Refer to the letter to the Commission from NERA (*Re: Resetting the Price Path Threshold Conference*) of 19 November 2003, included in Orion, November 2003, above n 51. NERA's 1997 estimates are presented in Makholm and Quinn, above n 29.

⁶⁵ Benchmark Economics, October 2003, above n 15, p 2; CRA, October 2003, above n 37, p 4.

- 229 The assets of UnitedNetworks Limited (UNL) were acquired by Vector, Powerco and Unison in the second half of the 2003 disclosure year. As a result, much of the 2003 disclosure data for Vector, Powerco and Unison are weighted averages, which do not fully reflect the pre-separation performance of UNL in the first half of 2003. Meyrick has scaled up the relevant data for these three distribution business to provide full year estimates. However, in the case of operating expenditures, apparent one-off or non-recurring indirect costs (primarily relating to the acquisition) were excluded.
- 230 Following these adjustments, the total operating expenditure in 2003 for Vector, Powerco and Unison shows an increase of around 7% over the combined 2002 operating expenditure for Vector, Powerco, Unison and UNL. This increase contributes to a marked rise in operating expenditure for the entire industry in 2003. Meyrick considered it unlikely that this high cost level is likely to be representative of the post-acquisition operating costs of the three distribution businesses involved in the UNL acquisition, and is a result of the approach taken to scaling the data.⁶⁶ Therefore, an analysis of distribution TFP which includes this 2003 data is likely to understate the long term TFP trend rate.
- 231 Horizon Energy drew the Commission's attention to an overstatement of Horizon's operating expenditure in its pre-2003 disclosure data.⁶⁷ The Commission accepts Horizon's submission and Meyrick has changed the data in the updated database accordingly. Apart from this specific change, the Commission and Meyrick have reviewed the full 1996-2003 database to adjust significant anomalies, taking into account the general submissions made on the disclosure data.⁶⁸ In addition, changes to the database were made relating to the separation of lines and retail businesses and the Auckland CBD outage.

Updated analysis of overall distribution business productivity (1996-2003)

- 232 Before re-estimating distribution TFP from 1996 to 2003, Meyrick used the econometric cost function analysis to recalculate the weighted average output shares now applicable to the revised distribution business database. Output cost shares changed slightly from the initial analysis, and were found to be 22% for energy, 32% for system capacity and 46% for connections.⁶⁹
- 233 Apart from specific changes made to the operating expenditure data, Meyrick also adjusted the trend in operating expenditure to remove the discontinuity caused by the separation of lines and retail businesses. On reflection, Meyrick considered that the approach used in the initial analysis to correct for the discontinuity put a lot of weight on just one year's change, namely 1997-98. For the updated analysis, Meyrick set the change in operating expenditure from 1998 to 1999

⁶⁶ Meyrick, December 2003, above n 7, Section 5.2.

⁶⁷ Horizon Energy, *Submission on the Regulation of Electricity Line Businesses, Draft Decisions on Resetting the Price Path Threshold*, 20 October 2003, pp 1-3.

⁶⁸ Detailed reviews of possible data inconsistencies were presented in: Powerco, *Powerco Response: Data Disclosure, Submission to the Commerce Commission in Response to the Invitation to Comment on Datasets for Potential Use in Resetting of the Price Path Threshold*, 8 July 2003; and Aurora, October 2003, above n 21, Section 3 and Appendices 2-4.

⁶⁹ Meyrick, December 2003, above n 7, Section 4.2.

equal to the average change in operating expenditure observed in the two years on either side of discontinuity.

- 234 Using the updated database, and adjusting for the discontinuity in operating expenditure, Meyrick found that aggregate distribution TFP, for the seven-year period 1996 to 2002, increased at a trend annual rate of 2.1%. Extending the analysis to include 2003 lowered the trend rate to 2.0%.⁷⁰ The main reason for the lower TFP trend rate over the eight-year period is the marked increase in industry operating expenditure from 2002 to 2003. As noted above, the majority of this increase can be attributed to the post-merger Powerco, Unison and Vector businesses, for which operating expenditure was scaled up to account for the non-disclosure of the first six months of UNL's relevant data for 2003.

Analysis of Transpower's Productivity

- 235 In its Initial Report, Meyrick reported that the trend TFP growth rate for transmission services from 1996-2002 was 2.3%. Relative to the economy as a whole, and adjusting for the input price differential, Transpower's implied B factor was 1.7%.⁷¹
- 236 In response, Transpower suggested that its B factor should be set more conservatively at 1% (given concerns regarding data quality). In Transpower's view, three aspects of the data need to be treated with care: the use of labour prices as proxies for input prices; the lack of transmission-specific input prices; and the fact that some estimates for economy-wide TFP have been higher than Meyrick's recommended value of 1.1%. Transpower also considered it appropriate to set Transpower's B factor distinctly from distribution businesses, arguing that transmission and distribution are fundamentally different businesses.⁷²
- 237 A number of distribution businesses considered there to be insufficient evidence to support a different B factor for Transpower. Some businesses argued that, if Transpower's TFP growth is lower than distribution businesses, it would be inequitable to reward Transpower going forward for its poorer past performance.
- 238 Since presenting its Initial Report, Meyrick has discovered that the operating expenditure series used for Transpower's initial TFP analysis included depreciation. However, a consistent series of Transpower's net operating expenditure data prior to 1999 is not currently available. While the requirement to separate lines and retail functions was not relevant to Transpower, its disclosures were affected by the change in cost allocation requirements between the 1994 and 1999 Regulations. Therefore, Meyrick has re-estimated Transpower's TFP using only data from 1999 to 2003. This analysis shows Transpower's productivity declining during this period. However, given the short time frame of the analysis, Meyrick cautions against placing too much weight on this result.

⁷⁰ *ibid* Section 5.2.

⁷¹ Meyrick, September 2003, above n 5, Section 7.3.

⁷² Transpower, *Submission to the Commerce Commission on Draft Decisions for Resetting the Price Path Threshold for Transpower*, October 2003, pp 5-6; Transpower, *Supplementary Submission on Resetting the Price Path Threshold for Transpower*, 18 November 2003, pp 1-2.

Decisions on the B Factors

- 239 Given that over the longer term, it is reasonable to expect that operating costs should fall as a result of the acquisition of UNL assets by Powerco, Unison and Vector, the Commission considers the eight-year distribution trend rate (including the 2003 disclosure data) to be overly conservative. Instead, the Commission considers that the best estimate of distribution TFP comes from the 1996 to 2002 data, and is therefore 2.1%.
- 240 For the regulatory period beginning in 2004, the Commission considers it prudent to make no adjustment to the B factor for any input price differential between the industry and the economy, given that some uncertainty arises from the inconsistent evidence on labour and capital input prices. However, during the regulatory period, the Commission intends to examine ways in which relevant input prices can be monitored with greater confidence. Therefore, adjusting distribution TFP (2.1%) for only economy-wide TFP growth (1.1%) results in a B factor for all distribution businesses of 1%.
- 241 The Commission considers that the updated TFP analysis of Transpower's performance does not cover a sufficiently long period to be useful in deciding on an appropriate B factor. Given that Transpower's price path threshold is only being set for one year, and the lack of strong evidence to the contrary, the Commission considers it appropriate to set Transpower's B factor to be the same as that for distribution businesses. However, in setting Transpower's thresholds to apply from 1 July 2005, the Commission may consider it appropriate to set a different B factor for Transpower.
- 242 The Commission has therefore decided to set a B factor of 1% for all lines businesses, including Transpower, for the regulatory period beginning in 2004.

RELATIVE DISTRIBUTION BUSINESS PERFORMANCE (C FACTORS)

243 This section outlines the Commission's approach to setting the C factors for distribution businesses, in light of the analysis of relative distribution business performance undertaken for the Commission by Meyrick, and taking into account relevant submissions from interested parties.

Methodology for Determining the C Factors

Multilateral TFP analysis

244 Traditional measures of TFP enable comparisons to be made of rates of change of productivity between organisations, but do not enable comparisons to be made of differences in the absolute levels of productivity in combined time series, cross sectional data. The multilateral TFP index measure is an extension of the TFP index approach used in deriving the B factor, and was developed to allow comparisons of the absolute levels of productivity as well as productivity growth rates. The MTFP index approach achieves this because it uses a methodology ensuring that comparisons between observations are independent of the observation chosen as the base reference (i.e. the business and the year).⁷³

245 MTFP analysis has been used by Meyrick to compare relative distribution business productivity. With the MTFP approach there is some scope to capture density-related operating environment conditions through the careful choice of business outputs. By specifying multiple outputs (such as energy delivered, MVA-kilometres and connections), it is possible to incorporate aspects of density, such as customer density (i.e. connections/km) and energy density (i.e. kWh/connection) into the MTFP measure directly, in a similar fashion to how this is captured in multiple output econometric cost functions.

246 The MTFP approach has the advantage of being relatively insensitive to data errors and does not require a large number of observations. Because it is levels that are of interest, rather than growth rates, the data series used for MTFP analysis does not need to be as long as that used for TFP analysis. Furthermore, using MTFP allows the B and C factors to be calculated in an integrated and consistent framework based on both productivity growth rates and absolute levels of productivity.⁷⁴

247 The application of MTFP for regulating electricity distribution was cited by a number of submitters as being without precedent. In addition, NERA (on behalf of Orion) argued that MTFP analysis requires critical assumptions, not borne out by empirical evidence from the US distribution industry, about the relationship between a distribution businesses rate of productivity growth and its capacity to alter that performance looking forward. Although at the conference PEG (on behalf of Powerco) expressed a slight preference for using a cost function approach rather than MTFP analysis for ranking relative distribution business

⁷³ The MTFP methodology was first detailed in D.W. Caves, L.R. Christensen and W.E. Diewert, Multilateral comparisons of output, input, and productivity using superlative index numbers, *The Economic Journal* 92, 1982, pp 73-86.

⁷⁴ Meyrick, December 2003, above n 7, Section 6.1.

performance, because of concerns regarding the stability of the rankings, PEG did not express any concerns regarding the MTFP methodology itself.⁷⁵

Deriving the C₁ factors

- 248 Following the MTFP analysis, distribution businesses are ranked on the basis of their MTFP index values averaged over the past five years. Businesses are then allocated to three groups (above-average performers, average performers and below-average performers, taking into account any clear ‘step points’ occurring in the rankings to mitigate possible boundary issues.
- 249 Distribution businesses performing near the industry average, and therefore in the middle productivity group, are assigned a C₁ factor of zero. Those distribution businesses in the lower productivity group are assigned a positive C₁ factor (the same value for all in the group).
- 250 The magnitude of this factor is selected by assessing the annual rate of productivity change needed for the average productivity of the lower group to reach the same productivity levels as the middle group, within two regulatory periods (i.e. ten years). Conversely, those distribution businesses in the higher productivity group are assigned the same negative C₁ factor, allowing them to retain relatively more of the benefits of any efficiency gains that they can make over the regulatory period.

Residual rate of return analysis

- 251 To be consistent with its reported MTFP analysis, relative distribution business profitability is determined by examining post-tax and pre-rebate (or pre-discount) ‘residual’ rates of return (ROR). Residual RORs are calculated by netting out disclosed operating expenditure, normalised depreciation and a disclosed tax adjustment from distribution business deemed revenue, and dividing through by ODV.
- 252 The residual rates of return approach was criticised by many distribution businesses as providing a poor measure of any excessive profits. Vector and Orion argued that the approach does not incorporate all costs needed to provide services, uses out-of-date and incomplete ODV values and does not differentiate between profits derived from superior performance and those derived from any over-pricing.⁷⁶

Deriving the C₂ factors

- 253 Following the calculation of residual RORs, distribution businesses are ranked on the basis of the values averaged over a number of years. Averages are taken recognising that distribution business operating expenditure tends to fluctuate from year to year. Businesses are then allocated to three groups, taking into account any clear ‘step points’ occurring in the rankings to mitigate possible boundary issues.

⁷⁵ NERA, October 2003, above n 25, p 31.

⁷⁶ Vector, October 2003, above n 62, p 2; Orion, October 2003, above n 24, p 20.

254 Those businesses exhibiting relatively lower residual rates of return are assigned a negative C_2 factor. Businesses achieving relatively higher residual rates of return are assigned a positive C_2 factor. All other distribution businesses receive a C_2 factor of zero. The magnitudes of the C_2 factors are selected to bring profits more into line over the next five years.

Composite C factors and overall X factors

255 The productivity and profitability components (i.e. the C_1 and C_2 factors) for each distribution business are then summed together. The resultant C factor is added to the B factor to determine the overall X factor that applies to the business for the entire five-year regulatory period.

Analysis of Relative Distribution Business Productivity

Initial analysis of relative distribution business productivity (1996-2002)

256 For the initial MTFP analysis of distribution businesses, Meyrick used the same database as that used for the initial TFP analysis (paragraph 198 above). When the estimated output cost shares derived from the econometric cost function analysis were used to weight the three outputs, a mixture of urban and rural distribution businesses, with both high and low energy densities, were found to have the highest MTFP levels. Distribution businesses were then ranked and assigned to three groups based on their MTFP index for 2002.

257 Meyrick tested the sensitivity of the MTFP results to output specification. The standard three outputs (energy delivered in kWh, system capacity in MVA-kilometres and connections) were used individually and in combination. Consistent with some of the concerns raised in submissions from distribution businesses, using energy alone appeared to bias the rankings in favour of urban, high energy density distribution businesses. Conversely, using only capacity tended to favour rural businesses. Meyrick cited similar results for MTFP analyses of distributors in Australia.⁷⁷

258 Meyrick considered whether the MTFP analysis should give special treatment to distribution businesses expecting to undertake significant capital expenditure (to expand coverage or to replace large sections of their existing asset base). Meyrick concluded the case for special treatment for new investment appears questionable, because it may impose perverse incentives on distribution businesses, such as to substitute capital for other inputs.⁷⁸

Stability of the MTFP rankings

259 As noted above, Meyrick used an econometric cost function to derive the output weights used in both the MTFP analysis and TFP analysis. In its Initial Report, Meyrick also described how the cost function analysis was used to provide a check on the rankings of distribution business productivity found using MTFP analysis.

⁷⁷ Meyrick, September 2003, above n 5, Section 8.2.

⁷⁸ *ibid* Section 8.7.

- 260 The cost function efficiency scores covered a wider range than those found from the MTFP analysis, but provided a broadly similar ranking for distribution business productivity. Nevertheless, some differences in rankings were evident between the two methods. Under the cost function approach, three businesses appeared in a more productive group, namely Orion, Aurora and Powerco.
- 261 Along with CRA (on behalf of Vector), Aurora and Powerco submitted various reasons why the econometric cost function would provide a more credible and robust method for comparing distribution business productivity than MTFP. A key reason provided was the apparently high volatility in the annual rankings found using MTFP. As supporting evidence, Powerco presented Spearman rank correlation coefficients of both the MTFP and cost function results. Powerco's analysis demonstrated that the individual rankings were more stable under the cost function approach.⁷⁹
- 262 The Commission considers that it is not surprising the cost function results exhibit more stable Spearman correlation coefficients, because any regression-based method tends to smooth the results. Further, the Commission observes the annual allocation of distribution businesses to groups is no less stable under the MTFP approach than under the cost function approach. This is encouraging, given the volatile nature of the industry (a point noted by NERA during the conference).
- 263 In addition, the MTFP rankings are not overly sensitive to changes in assumptions. Before updating the database to include the 2003 disclosure data and to correct various data anomalies, Meyrick examined the effect of removing the more variable pre-1999 disclosure data from the MTFP analysis. Although using this subset of the database resulted in some minor changes in rankings, no distribution business was found to shift between the above-average, average, or below-average C₁ factor groups. Similar, the effect of using PBA's voltage conversion factors resulted in no changes in groups, lending support to the view that the MTFP rankings are relatively stable.
- 264 However, to mitigate any remaining concerns regarding the volatility of the rankings, the Commission has decided to rank distribution businesses by the five-year average of their MTFP indexes from 1999 to 2003, rather than by the MTFP indexes observed in any single year.

Normalisation of factors beyond the control of distribution businesses

- 265 A number of submitters criticised the MTFP analysis as not being able to satisfactorily account for operating environment differences. CRA states that observing the MTFP scores are visually uncorrelated with density is not an acceptable test for normalisation. According to CRA, Meyrick's model penalises businesses with lower customer density, and therefore should not be used to set C factors.
- 266 The Commission observes that, with the exception of three very small and dense distribution businesses, there is a relatively strong correlation between customer density and scale across the industry (measured in terms of any of the three

⁷⁹ Powerco, October 2003, above n 12, pp 18-19.

distribution outputs). The Commission considers that providing explicit concessions to scale is not consistent with the Purpose Statement. Fully normalising for all indications of customer density would likely normalise for scale, possibly providing implicit disincentives in the price path threshold to the natural rationalisation of the industry.

Updated analysis of relative distribution business productivity (1999-2003)

- 267 The Commission considers that it is preferable not to use the less consistent pre-1999 disclosure data for any comparison of distribution business performance. Therefore, only data from 1999-2003 has been used for the updated MTFP analysis. Apart from fewer years of data, the database used for this analysis is the same as that used for the updated TFP analysis. The new MTFP indexes are provided in Table 4 of Meyrick's Final Report.⁸⁰
- 268 Rather than being ranked on the final year MTFP indexes, distribution businesses have been ranked on their average MTFP indexes for the five-year period 1999 to 2003. These rankings are provided in Appendix 1 of this paper.
- 269 So that the results of the updated and initial analysis can be compared, UNL is included in the rankings based on the average of its MTFP rankings from 1999 to 2002. Consequently, the pre-2003 MTFP indexes for Powerco, Unison and Vector are the indexes applicable to the stand alone businesses. No attempt has been made to allocate UNL's 1999-2002 disclosure data across the three businesses which acquired its assets in 2003.
- 270 Compared with the initial analysis, Centralines, Top Energy and Horizon Energy have shifted into a more productive group. This is because the operating costs of the latter two businesses have been reduced to more adequately reflect actual expenditures associated with distribution services (paragraph 231). Centralines has shifted groups because the boundary has been set to include fewer businesses in the lower performing group.

Analysis of Relative Distribution Business Profitability

Initial analysis of relative distribution business profitability (2000-2002)

- 271 In Meyrick's Initial Report, residual rates of return were determined for all distribution businesses in each year from 2000 to 2002. Normalised depreciation for each business was set at a percentage of ODV to be consistent with the depreciation weighting used in both the TFP and MTFP analysis. Businesses were then ranked based on the averages of pre-tax residual rates of return. Meyrick indicated that, while these values were not directly comparable to estimates of efficient WACC, the resultant rankings were similar to those obtained by ranking disclosed return on investment (ROI) values, after being adjusted to be on a pre-rebate basis with revaluations netted out.⁸¹

⁸⁰ Meyrick, December 2003, above n 7, Section 6.2.

⁸¹ Meyrick, September 2003, above n 5, Section 8.6.

Deemed revenue

- 272 Aurora and Benchmark Economics (on behalf of Powerco) pointed out that, in the initial residual ROR analysis, the definition of ‘deemed revenue’ double counted AC loss rental rebates. This error has been corrected in the updated analysis and in Meyrick’s Final Report. Along with Orion, Benchmark Economics argued that deemed revenue should not include other operating revenue, as disclosed in the *Gazette*.⁸² Much, though not all, of the other operating revenue disclosed by distribution businesses relates to customer or notional capital contributions for new network investment, and these amounts generally do not relate to posted prices.
- 273 The Commission considers that clear principles on the treatment of capital contributions are still needed, but intends to address this issue as part of its planned review of information disclosure requirements during 2004.⁸³ Hence, other operating revenue has been excluded from the definition of deemed revenue for the purposes of deriving residual rates of return.
- 274 Deemed revenue is therefore defined as line charge revenue, plus revenue from transfer payments, plus AC loss rental revenue, less AC loss rental expense, less transmission charges, less avoided transmission charges. This results in a measure broadly comparable to notional revenue in the price path threshold.

Depreciation and valuation

- 275 Aurora and The Lines Company both submitted that it would be more appropriate to determine depreciation in the residual ROR calculation on an optimised replacement cost (ORC) basis. NERA (on behalf of Orion) submitted that measures of economic returns based on ODV should incorporate a measure to revalue assets upward, given that the replacement costs in the current ODV Handbook are not up-to-date. The Commission considers that the rankings of distribution businesses with respect to profitability are relatively insensitive to these issues.⁸⁴

Treatment of rebates and tax

- 276 A number of distribution businesses suggested explicitly adjusting for rebates, as well as for any under-recovery of the cost of capital, so that the price path threshold will provide no disincentives for future investments. However, MEUG submitted that distribution businesses earning less than their WACC, but facing new investment, should put their case to the Commission following a breach of the thresholds.⁸⁵

⁸² Benchmark Economics, October 2003, above n 15, p 10; Aurora, October 2003, above n 21, p 8; Orion, October 2003, above n 24, pp 21-22.

⁸³ Commerce Commission, *Regulation of Electricity Lines Businesses, Development of Information Disclosure Regime, Process Paper*, 16 October 2003.

⁸⁴ Aurora, October 2003, above n 21, p 27; The Lines Company, *Submission on Behalf of The Lines Company*, October 2003, p 1; NERA, *Estimating the Rate of Economic Profit for Electricity Lines Businesses, a Report for Orion New Zealand Limited*, November 2003, p 1.

⁸⁵ MEUG, June 2003, above n 17, p 2.

- 277 NERA argued that using a pre-tax measure of profitability does not allow proper comparisons to be made. Powerco also argued that, were a more appropriate (i.e. higher) WACC range used for comparison with the residual returns approach, very few businesses would be allocated a positive C₂ factor.⁸⁶
- 278 The Commission agrees that it is more appropriate to compare distribution business profitability on a post-tax basis, given the business-specific implications of different governance and ownership arrangements. Using post-tax comparisons, and assigning a negative C₂ factor to those businesses that have consistently been earning low returns, should generally be sufficient to deal with concerns regarding the ability of businesses to undertake new investment. For situations where this may not be the case, the Commission can weigh up the relevant considerations during a post-breach inquiry.

Updated analysis of relative distribution business profitability (2000-2003)

- 279 In Meyrick's updated analysis, residual RORs have been determined using corrected deemed revenue, and by adjusting for tax on the same basis as for the ROI values disclosed under the Regulations. Income tax, one-third of total subvention payments and the income tax shield have all been netted out of the numerator of the residual ROR. The updated analysis confirms that a C₂ factor of ± 1 is appropriate.⁸⁷
- 280 With the exception of Powerco, Unison and Vector, for which 2003 deemed revenue data is neither available nor readily able to be estimated, distribution businesses have been ranked on their average residual RORs for the four-year period 2000 to 2003. The three business involved in the acquisition of UNL have been ranked on their average residual RORs from 2000 to 2002 instead. Rankings are provided in Appendix 1 of this paper.
- 281 Businesses have been allocated to three groups based on average, below-average and above-average profitability. Compared with the initial residual ROR analysis, a number of businesses have shifted into different groups. This partly results from revisions made in the updated database to the operating expenditure data, but is primarily due to changing the residual RORs to be on a post-tax basis.
- 282 With respect to the initial analysis, MEUG found very poor correlation between the assignment of businesses to C₂ factor groups and the magnitude of what it considered to be past excess profits. MEUG recommended ensuring that the C₂ factors more closely relate to disclosed ROIs, examining whether wider bands of C₂ should be used, and having a steeper glide path (i.e. one to three years).⁸⁸
- 283 It is possible that these concerns regarding the difference between the residual ROR values and disclosed ROIs may still remain following a review of the results of the updated profitability analysis. However, the Commission highlights that that the residual RORs have been determined on a pre-rebate basis, because the price path threshold is applied to notional revenue derived from posted prices. In contrast, disclosed ROIs have been calculated on a post-rebate basis. A number

⁸⁶ NERA, November 2003, above n 84, p 1; Powerco, October 2003, above n 12, p 22.

⁸⁷ Meyrick, December 2003, above n 7, Section 6.4.

⁸⁸ MEUG, November 2003, above n 15, p 2

of distribution business that make relatively low post-rebate returns, have relatively high pre-rebate average prices. To comply with the price path threshold, these businesses will need to make their own decisions whether to reduce prices and/or rebates, or to improve efficiencies such that their current level of rebates can be maintained on a sustainable basis consistent with the long-term benefit of their consumers.

- 284 The Commission also notes that some of the disclosed ROIs have been overstated due to differing ways of evaluating depreciation. Distribution businesses that have used, or have acquired businesses that have used, infrastructural accounting, may have disclosed comparatively low levels of depreciation. Conversely, when compared to disclosed direct and indirect operating costs, some businesses appear to use notably different operating expenditure values for the purposes of calculating disclosed ROIs. The residual ROR approach allows for a potentially more consistent comparative treatment of both depreciation and operating expenditure.

Decisions on the C Factors

- 285 The overall C factor has been derived by combining the C_1 and C_2 factors determined from the updated MTFP analysis and updated residual ROR analysis described above.
- 286 In its Initial Report, Meyrick proposed that the overall C factors be capped at $\pm 1\%$. Although considering the C factors in Meyrick's Initial Report to be unsubstantiated, PwC (on behalf of 18 distribution businesses) submitted that capping the C factors at $\pm 1\%$ represented a conservative approach. However, Powerco argued that the risks arising from deriving the C factor from poor data warranted a value for C no greater than $\pm 0.5\%$. Aurora also recommended a range of $\pm 0.5\%$, or some value lower than the magnitude of the B factor. CRA proposed limiting the C_1 factors to $\pm 0.1\%$, and Vector recommended C_1 be in the order of $\pm 0.1\%$ to $\pm 0.2\%$. On the other hand, Unison considered there to be no reason why the profitability component of the C factor should be limited to -1% for those businesses earning sub-normal returns.⁸⁹
- 287 In the updated analysis, no distribution business has received both a positive C_1 and C_2 factor, although for three businesses both factors are negative. The Commission considers that allowing relatively more productive distribution businesses with below-average returns the benefit of both component C factors is consistent with the Purpose Statement.
- 288 The Commission has therefore decided to set C factors (and overall X factors) applying to each distribution business for the regulatory period beginning in 2004 as listed in Appendix 1.

⁸⁹ PwC, October 2003, above n 59, p 6; Powerco, October 2003, above n 12, p 1; Aurora, October 2003, above n 21, p 4; CRA, October 2003, above n 37, p 3; Vector, October 2003, above n 62, p 5; Unison, October 2003, above n 12, p 28.

APPENDIX 1 X FACTORS FOR LINES BUSINESSES

Lines Business	X (=B+C)	B	C (=C ₁ +C ₂)	C ₁	C ₂
Centralines	2%	1%	1%	0%	1%
Counties Power	2%	1%	1%	0%	1%
Eastland Network	2%	1%	1%	1%	0%
Electra	2%	1%	1%	0%	1%
MainPower	2%	1%	1%	1%	0%
Marlborough Lines	2%	1%	1%	1%	0%
Powerco	2%	1%	1%	0%	1%
The Lines Company	2%	1%	1%	0%	1%
WEL Networks	2%	1%	1%	0%	1%
Alpine Energy	1%	1%	0%	0%	0%
Aurora Energy	1%	1%	0%	1%	-1%
Buller Electricity	1%	1%	0%	1%	-1%
Electricity Ashburton	1%	1%	0%	1%	-1%
Horizon Energy	1%	1%	0%	-1%	1%
Nelson Electricity	1%	1%	0%	-1%	1%
Network Tasman	1%	1%	0%	-1%	1%
Orion	1%	1%	0%	0%	0%
<i>Transpower</i>	1%	1%	N/A	N/A	N/A
Westpower	1%	1%	0%	1%	-1%
Electricity Invercargill	0%	1%	-1%	-1%	0%
Network Waitaki	0%	1%	-1%	0%	-1%
Scanpower	0%	1%	-1%	-1%	0%
The Power Company	0%	1%	-1%	0%	-1%
Top Energy	0%	1%	-1%	0%	-1%
Unison Networks	0%	1%	-1%	0%	-1%
Vector	0%	1%	-1%	-1%	0%
Northpower	-1%	1%	-2%	-1%	-1%
OtagoNet	-1%	1%	-2%	-1%	-1%
Waipa Networks	-1%	1%	-2%	-1%	-1%

APPENDIX 2 GLOSSARY

List of terms, abbreviations and acronyms	
The Act	Commerce Act 1986
The Commission	Commerce Commission
Control	Means, having made a declaration of control in respect of goods or services supplied by an electricity lines business in markets directly related to distribution and transmission services, the Commission making a provisional authorisation, final authorisation, or accepting an undertaking from the lines business in respect of prices, revenues or quality, in accordance with Part V of the Act
CPI	Consumer Price Index
Distribution Business	A lines business providing distribution services rather than transmission services (i.e. a lines business other than Transpower)
EV	Economic Value
FTR	Financial Transmission Right
kW	kilowatt (a measure of real power)
kWh	kilowatt hour (a measure of electrical energy)
kVA	kilovolt-amperes (a measure of electrical capacity and apparent power)
Lines Business	A business defined to be a 'large electricity lines business' in s 57D of Part 4A, including Transpower
MTFP	Multilateral total factor productivity
ODV	Optimised Deprival Value
Part 4A	Part 4A (Provisions Applicable to Electricity Industry) of the Commerce Act 1986, which commenced on 8 August 2001
Regulations	The Electricity (Information Disclosure) Regulations 1994 and 1999
Requirements	The Electricity Information Disclosure Requirements 2004, published by the Commission
ROI	Return on investment
ROR	Rate of return
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
System Minutes	The amount calculated by dividing estimated energy not supplied by system maximum demand during a period (expressed in minutes)
TFP	Total factor productivity
WACC	Weighted average cost of capital