Assessment of selected distributors' alignment against the Information Disclosure Guidelines, and their consideration of the Pricing Principles

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Glossary

Act – the Electricity Industry Act 2010

After Diversity Maximum Demand (ADMD) – the combined half-hourly peak demand of a group of ICPs over a given time period (e.g. a month, season or year)

Anytime Maximum Demand (AMD) – an individual ICP's half-hourly peak demand over a given time period

Authority – the Electricity Authority

CBA – Cost Benefit Analysis

Coincident Peak Demand (CPD) – another term for ADMD

Commission – the Commerce Commission

CPI – Consumer Price Index

Criteria – Evaluation criteria developed for this review, given in Table 1

Disclosure – Pricing methodology disclosure

EDB – Electricity Distribution Business

GPS – Government Policy Statement on Electricity Governance 2009

Guidelines – Information Disclosure Guidelines

GXP – Grid Exit Point

HW – Hot Water

ICP – Installation Control Point

kVA – Kilo Volt Ampere, a measure of electricity *capacity*

kW – Kilo Watt

kWh - Kilo Watt hour = 1 kW generated for 1 hour.

LRAIC – Long Run Average Incremental Cost

MW – Mega Watt = 1,000 kW

MWh - Mega Watt hour = 1 MW generated for 1 hour

Peak demand/load – the point of maximum load over a period of time, measured over one half hour

Principles – Pricing Principles

Regulators – the Electricity Authority and Commerce Commission

TOU – Time Of Use

VoLL - Value of lost load

1 Executive summary

1.1 Background

In March 2010, the Electricity Commission published a paper[1] which contained a set of Pricing Principles ('Principles') and Information Disclosure Guidelines ('Guidelines'). While the publication of such Principles and Guidelines was the culmination of an extensive development exercise[2], it marked only the start of an ongoing process for the electricity regulator – now the Electricity Authority ('Authority') – to have oversight of electricity distribution businesses' (EDBs') pricing approaches, including through the use of regular reviews of such approaches.

This current review is that indicated in the paper as starting in March 2011. It has three main objectives:

1) Review the EDBs' pricing methodologies to assess the extent to which EDBs have followed the Information Disclosure Guidelines;

2) Review the EDBs' pricing methodologies to assess whether the EDBs have demonstrated that they have considered the Pricing Principles in developing their tariff structures.

3) Based on such assessments, make recommendations for improving the Principles, Guidelines, or supporting material published by the Authority, in order to best facilitate the EDBs' achievement of outcomes that deliver on the intent of the Principles.

For the purposes of this exercise rather than examine all 28 EDBs' approaches, this review only looked at nine representative EDBs: Horizon, Marlborough Lines, Orion, Powerco, PowerNet, The Lines Company, Unison, Vector, and Westpower. The sample covered the 4 largest distributors and two smaller EDBs from the North Island and three from the South Island to ensure adequate coverage.

Concept and the Authority had face-to-face or teleconference discussions with each of the nine EDBs during the course of this review, with the feedback obtained being reflected in the final assessments in this report and the resulting recommendations.

An important point of clarification is that the second objective of this review is to assess whether EDBs have demonstrated that they have *considered* the Pricing Principles in developing their tariff structures – not whether their tariff structures *are* consistent with the Pricing Principles. That will be the subject of the second review which the Electricity Commission paper indicated would start in Autumn 2012. The conclusions stemming from this review are to provide more guidance for EDBs.

1.2 Approach

A key consideration in conducting this exercise is what type of information should be published by EDBs in order to comply with the Guidelines, and to what level of detail?

This has been interpreted as being that which would be sufficient to enable a suitably qualified expert to undertake a formal assessment of an EDB's pricing methodology to determine whether it achieves the objectives of the Principles. All nine EDBs agreed that such a level of disclosure would be necessary to enable the Authority to undertake its 2012 review.

[1] Electricity Commission, Feb 2010 http://www.ea.govt.nz/document/3760/download/our-work/programmes/transmission-work/principles-or-model-approaches-to-distribution-pricing/

[2] Details of the full process undertaken by the Electricity Commission to develop the Pricing Principles and Information Disclosure Guidelines can be found on the Electricity Authority website at: http://www.ea.govt.nz/our-work/programmes/transmission-work/principles-or-model-approaches-to-distribution-pricing/

Each EDB has been assessed against each of the Guidelines. In order to limit subjectivity and facilitate consistency of evaluation across distributors, a set of evaluation criteria were developed which described the type, level, and approach to information disclosure deemed necessary to be judged to have met each Guideline. While the criteria applied have not been previously disclosed, these questions were considered to be what parties acting reasonably would ask themselves when seeking to demonstrate alignment with the Guidelines. This preliminary review proved useful in testing these criteria.

As well as qualitatively assessing whether a distributor has met the requirements for a particular Guideline, a quantitative score has also been applied to help facilitate distinguishing between instances where the 'letter' of a Guideline has been met, and where the intent of the Guideline has been met. It is expected that such an approach will help to distinguish instances of best practice among the nine EDBs, which may then assist all EDBs in the preparation of next year's disclosure document.

An overall score for each EDB has also been calculated, being the *weighted* average of the scores for each element of the Guidelines. A weighting has been applied to each part of each guideline to reflect the fact that some Guidelines are likely to be more important for achieving the purpose of the Guidelines and Principles than others. Such weightings are subjective to some degree, but it is considered that those elements of the Guidelines which relate to demonstrating the economic rationale behind a particular pricing approach are more important than other elements of the Guidelines.

Feedback from the EDBs during the course of the review has lead us to believe that our initial expectations with regards to the amount of detail that EDBs should be required to disclose, were too high for some aspects of the pricing methodologies (particularly requiring analysis of possible alternative approaches to customer grouping and cost allocation approaches).

Accordingly, the final evaluation criteria and associated scoring presented in this report incorporates such feedback.

Also in response to such EDB feedback, the decision has been made to anonymise the scores and associated discussions published in this report. i.e. companies are referred to as 'Company A', 'Company B', etc. rather than actual name. The reasons for this were as this is the first year the Authority has prepared this report and only a sample of distributors had been consulted, it would be inappropriate to publish the results for this year. In addition, the Authority did not signal at the outset that it would be publishing the scores. The Authority intends to repeat the process again next year with all distributors and will make full disclosure at that time.

1.3 Evaluation of the nine EDBs' alignment against the Information Disclosure Guidelines

As Table 1 sets out, EDBs generally scored poorly against the criteria developed.

Table 1: Summary evaluation of all EDBs against Guideline criteria

Guideline	Weighting	Company A	Company B	Company C	Company D	Company E	Company F	Company G	Company H	Company I	AVERAGE
(a) Prices should be based on a well-defined, clearly explained and published methodology, with any material revisions to the methodology notified and clearly marked.											
Methodology is well-defined	100	1.5	1.0	0.5	2.5	2.5	1.0	2.0	2.0	1.0	1.6
Methodology is clearly explained	30	1.5	2.0	0.5	2.5	1.5	2.0	2.0	2.0	1.5	1.8
Methodology is published	15	2.0	2.5	2.0	2.5	3.0	2.5	2.0	2.0	2.0	2.3
Revisions are notified and clearly marked	15	2.0	2.5	2.0	2.5	1.0	1.0	1.0	2.0	2.5	1.8
(b) The pricing methodology disclosed should demonstrate:											
(i) How the methodlogy links to the pricing principles and any non-compliance											
Links to Principles outlined	100	1.5	1.0	1.0	1.0	0.5	1.0	1.0	1.0	1.0	1.0
Non-compliance identified	30	1.5	1.0	1.0	1.0	1.5	2.0	2.5	2.0	1.0	1.6
(ii) The rationale for consumer groupings and the method for determinging the allocation of consumers to the consumer groups;											
Consumer groups are outlined	30	1.5	2.5	2.0	3.0	2.0	2.5	2.5	2.5	1.5	2.3
Rationale for groupings provided	70	1.0	1.5	1.0	2.5	1.0	0.5	2.0	2.0	1.5	1.4
(iii) Quantification of key components of costs and revenues;											
Key components of costs included	100	1.5	1.5	1.0	2.5	2.0	1.0	2.0	2.0	1.5	1.7
key components of revenues included	50	2.0	2.0	2.0	2.0	1.5	2.0	2.0	2.5	2.0	2.0
(iv) An explanation of the cost allocation methodology and the rationale for the allocation to each consumer grouping;											
Cost allocation methodology explained	30	1.5	1.5	1.5	2.5	1.5	2.5	2.0	2.5	2.0	1.9
Rationale provided	70	0.5	1.5	0.5	2.0	1.0	2.0	1.5	2.0	1.5	1.4
(v) An explanation of the derivation of tariffs to be charged to each consumer group and the rationale for the tariff design;											
Tariff derivation is explained	50	1.0	2.0	1.5	2.5	1.5	1.5	1.5	2.0	1.0	1.7
Rationale provided	100	1.0	1.5	1.0	2.5	2.5	1.0	1.5	1.0	1.5	1.5
(vi) Pricing arrangements that will be used to share the value of any deferral of investment in distribution and transmission assets, with the investors in alternatives such as distributed generation or load management, where alternatives are practicable and where network economics warrant.											
Pricing arragements outlined	70	1.5	1.5	1.5	2.0	2.0	1.5	1.5	2.0	1.5	1.7
(c) The pricing methodology should:											
(i) Employ industry standard terminology, where possible; and											
Industry standard terminology used	10	2.5	2.5	2.0	2.5	2.0	3.0	2.0	2.5	2.0	2.4
(ii) Where a change to the previous pricing methodology is implemented, describe the impact on consumer classes and the transition arrangements implemented to introduce the new methodology.											
Impact described	10		2.0						1.5		1.8
Transition arrangements discussed	10		1.5						1.5		1.5
Weighted average score		1.4	1.5	1.1	2.2	1.7	1.4	1.7	1.8	1.4	1.6

Mostly, the nine EDBs generally provided reasonable information about *what* has been done in their pricing methodology[3]. However, there was often little information as to *why* a particular approach was chosen with respect to how such an approach was deemed best suited to delivering on the objectives of the Principles. This was especially the case for why an EDB had chosen a particular tariff structure (as distinct to why the EDB had chosen a particular customer grouping / cost allocation approach).

Most suggested that such poor scoring was indicative of their not being aware of the detailed criteria which they would be evaluated against. This is a fair point and it is likely, based on feedback from the EDBs, that if the nine EDBs had been aware of the detailed evaluation criteria at the time they were developing their pricing methodology documents, they would have scored materially higher.

However, it is considered that this is one of the valuable aspects of this review in terms of highlighting issues relating to information disclosure (including, as mentioned earlier, scaling back

[3] However, there was generally less information describing their final tariff structures (i.e. as distinct to describing their customer grouping/cost allocation approaches), and particularly in relation to controlled tariff options.

the initial expectations as to the level of disclosure required based on EDB feedback), such that all EDBs have a much clearer understanding of what is expected for the 2012 review, and thus hopefully facilitating a successful outcome.

1.4 Evaluation of the extent to which the nine EDBs have considered the Pricing Principles

All EDBs explicitly stated that their methodologies were consistent with the Principles, and thus appear to have considered them to some extent.

However, there are a number of factors which appear to suggest that different EDBs may have considered them differently.

- They have adopted very different pricing methodology approaches to customer grouping, cost allocation, and (particularly) tariff structures, with consequential major differences in the nature and scale of price signals sent to customers;
- There are some apparent significant inconsistencies in pricing signals sent to different classes of customers within some EDB's network areas; and
- Several indicated that they would like to adopt 'better' pricing approaches, but were constrained by various factors including: retailer opposition to change; rural-urban and low fixed regulatory requirements; and the perceived risks of changing pricing approaches arising from the price control regime.

That said, no detailed analysis has been undertaken to establish whether the observed differences in pricing approaches were appropriate reflections of different network situations.

However, to the extent that such differences can't be explained by different network situations (and some of the analysis presented in this report indicates that network differences appear not to be a significant cause of such diversity in approaches), then the analysis set out in Appendix F indicates there could be material adverse effects on economic efficiency, which would be inconsistent with the Pricing Principles.

In particular, the analysis appears to suggest that differences in approach to tariff structure design (as distinct to customer grouping and cost allocation approaches) could be resulting in significant differences in the economic efficiency of outcomes.

1.5 Recommendations

1) It is <u>not</u> recommended that the Principles or Guidelines themselves need revising.

In this respect, although some aspects of the Principles are relatively 'broad' and thus could potentially result in a wide range of pricing approaches being deemed consistent with the Principles, this is an inherent issue with any principles-based approach, and not necessarily an issue with the specific Principles in question. Indeed, it is hard to see how the Principles could be more specific with respect to defining the 'best' approaches, without entering the realms of prescriptive specification of methodologies. This is a view that was shared by all nine EDBs who considered that they were appropriate.

2) The Authority should publish two sets of more detailed evaluation criteria which the Authority will use to assess EDBs for future reviews: one set for assessment against the Guidelines, and one set for the Principles.

As well as providing useful guidance to the EDBs about the nature of the information they need to provide, such detailed criteria should help further clarify the nature of the desired outcomes the Authority is seeking to achieve, without resorting to prescription about particular pricing methodologies.

There were concerns expressed by some EDBs that the pricing methodology documents could become overly costly and cumbersome if they were required to contain all the information required to enable such a review, particularly quantitative analyses. These are valid concerns. Accordingly, it is felt that the best outcomes could be achieved if the pricing methodology documents contain the main descriptions of the approaches, and *reference* other documents (and spreadsheets where appropriate) published on the EDB's website. However, ultimately it is for the EDBs to decide in which document(s) to publish the various relevant pieces of information.

2)a) Such detailed criteria should be published as far in advance as possible in order that the EDBs have sufficient time to take them into consideration when developing their pricing methodologies.

2)b) Such criteria should not change materially from year to year without good reason.

All EDBs indicated that it is hard for them to undertake processes such as developing pricing methodologies if they are faced with a moving target due to the evaluation criteria, and/or their application, changing from year to year. A stable set of criteria that are signalled well in advance will best enable EDBs to develop durable pricing approaches, and provide the necessary level of detail in their information disclosures.

2)c) Such criteria should be developed with input from the EDBs and other interested stakeholders.

The process of conducting this review has already resulted in a detailed set of criteria for evaluation against the Guidelines being developed. While these have already incorporated some useful feedback from the nine EDBs during the course of the review, canvassing the views of the other 18 EDBs could lead to additional issues being identified which could result in the criteria being further refined[4].

With respect to the evaluation criteria for the assessment against the Principles, section 6.3 has set out some initial suggestions for the type of analysis that could usefully be undertaken. While these are not in a form that could represent detailed criteria, it is suggested that in advance of the Authority developing such detailed criteria for the 2012 review, it could be useful to get industry feedback on such suggestions. (i.e. whether the type of analysis suggested is appropriate; whether some important aspects have been omitted or unimportant ones included; whether more guidance is sought on the specifics of such analysis; and possible suggestions for such specifics).

For both the Guidelines criteria and Principles criteria, the Authority needs to decide whether to seek such stakeholder input via a formal consultation process (and the incur the associated cost and timeframe), or via a less formal process (e.g. using trade associations such as the Electricity Networks Association as a conduit to gather such views).

[4] That said, there was a strong degree of consistency among the nine EDBs, which suggests that the likelihood of significant additional issues being identified with respect to review against the Guidelines (as distinct to the Principles) is relatively low.

The level of information disclosure implied by the evaluation criteria suggested in Table 2 and section 6.3 will be relatively detailed. During the course of the review, some EDBs questioned whether the level of detail was justified. In some cases, as already mentioned, feedback from the EDBs has lead to the level of detail required being scaled back. However, in others, analysis undertaken for this review suggests that such a level of detail is appropriate.

In this respect this information disclosure should be considered within the wider context of the Authority using a 'light-handed' regulatory approach to improving distribution pricing consisting of *voluntary* Pricing Principles.

However, this relatively light-handed Principles-based approach can only succeed if:

- the regulator has good quality information with which to assess whether the intent of the Principles is being achieved – hence the Guidelines; and
- the intent of the voluntary approach is acted on by the EDBs.

Otherwise more prescriptive approaches may be the only option available to the regulator which, as was identified in the original Electricity Commission process, risk unintended consequences through not appropriately recognising the differences in network situations which may justify different approaches

Given the complexity of some of the issues associated with distribution pricing, it is judged that the provision of more information (and of a suitable quality) should reduce the risk to EDBs (and New Zealand more generally) of ill-informed regulatory decisions on pricing approaches which, given that the value of electricity distribution assets is approximately $7-$8 billion, should outweigh the costs of providing such information.

That said, it is also understood that progression towards more efficient pricing methodologies is not going to happen overnight. Rather, it is understood that the Authority considers this process as being a 'journey', and that *two-way* exchange of information between the Authority and EDBs, and between EDBs, is an important aspect of helping EDBs progressively move to more efficient pricing approaches that will deliver the greatest benefit for consumers in the long-term.

Thus, this intent for a collaborative, continual improvement processes, has also been in mind when developing the evaluation criteria and recommendations for possible future improvements to this overall process.

3) Future such reviews should
   a) employ face-to-face (or teleconference) dialogue with the EDBs in addition to desk-top evaluations; and
   b) publish the detailed evaluations of each of the EDBs

Based on feedback from the EDBs and the reviewers' own experience, the face-to-face and two-way nature of the dialogue for this review was considered to have been of considerable benefit to both parties in helping identify, and get the necessary information on, the key issues.

Further, publishing the detailed evaluations was mentioned by EDBs as delivering positive outcomes in terms of:

- Clearly highlighting examples of best practice; and

- Creating a healthy 'competitive tension' among EDBs in terms of wanting to score well relative to their peers[5].

4) It is suggested that the Authority engage with EDBs to provide some guidance relating to those issues which EDBs perceived as being constraints on their ability to make changes to their pricing methodologies

In this respect, some EDBs suggested that they were constrained in their ability to make changes to their pricing methodologies due to a number of factors:

- Potential legal action from retailers opposed to some pricing methodology changes[6];
- Being constrained on cost allocation approaches because of factors such as rural-urban pricing constraints;
- General constraints on the ability of EDBs to implement changes which could result in significant 'price shocks' to some groups of customers; and
- Some EDBs facing asymmetric risks due to the application of the price control regime[7].

Some EDBs suggested that the presence of such constraints meant that the effort involved in producing information for the pricing methodology reviews would not be justified, as any potential improvements to existing methodologies could not be made.

It is considered that such factors do have the potential to be material constraints on some EDBs, although it is out of scope of this report to assess whether they are more perceived than actual.

However, irrespective of whether such constraints are more perceived than actual, it is not considered that providing information about the efficiency of a pricing methodology is a 'wasted' exercise. It is only through the provision of good quality information that political, regulatory, or even judicial decision makers, who may be in a position to address such constraints, can make appropriate choices.

With respect to such potential barriers themselves, as long as they are perceived to exist it is less likely that EDBs will move to implement changes to their pricing methodologies, even if they may deliver better outcomes for consumers in the long-run.

Accordingly, it is suggested that there would be benefit to the Authority engaging with EDBs and providing some guidance relating to each of the above issues – potentially in conjunction with other government / regulatory bodies (e.g. MED in the case of rural-urban pricing relativity issues, and the Commerce Commission in the case of price control issues).

[5] Parallels were drawn with similar outcomes for the Commerce Commission's review of EDB's asset management plants.

[6] One EDB cited the instance of a distributor being taken to court by the largest retailer on their network over their proposal to implement GXP pricing in order to deliver (in the distributor's view) more efficient prices.

[7] I.e. any change to a pricing methodology introduces uncertainty with regards to how much revenue an EDB will earn relative to target, as there is little experience with regards to how consumers will respond to such changed price signals. There appears to be a perception that regulatory treatment of consequent 'over-charging' would be treated differently to 'under-charging' such that, on balance, an EDB will under-recover relative to target.

5) The Authority and Commerce Commission should work to ensure consistency[8] of regulatory disclosure requirements, and potentially consider a single disclosure requirement relating to electricity distribution pricing that would cover both their needs.

In this respect, many EDBs suggested that consistency of regulatory approach was important to prevent any unintended adverse regulatory outcomes, as well as potentially providing opportunities to minimise the amount of unnecessary effort from all parties in terms of disclosing and analysing the various information disclosure items.

To that end, it is understood that the Authority and Commission are already engaged in dialogue on how best to ensure consistent and efficient regulatory outcomes.

[8] Consistency between then electricity and gas sectors, and their different requirements relating to electricity.

2 Introduction

In March 2010, the Electricity Commission published a paper[9] which contained a set of Pricing Principles (the 'Principles') and Information Disclosure Guidelines (the 'Guidelines'). While the publication of such Principles and Guidelines was the culmination of an extensive development exercise[10], it marked only the start of an ongoing process for the electricity regulator – now the Electricity Authority (the 'Authority') – to have oversight of electricity distribution businesses' (EDBs') pricing approaches, including through the use of regular reviews of such approaches.

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For the purposes of this exercise rather than examining all 28 EDB's approaches, this review only looked at nine representative EDBs: Horizon, Marlborough Lines, Orion, Powerco, PowerNet, The Lines Company, Unison, Vector, and Westpower which covered the 4 largest and two smaller EDBs from the North Island and three smaller EDBs from South Island.

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Structure of this paper

The Principles and Guidelines are only one aspect of a number of different regulatory requirements on EDBs. Thus, section 3 sets out how the Principles and Guidelines sit within this broader regulatory framework.

Section 4 then describes the methodology that has been adopted for this review.

Section 5 sets out a summary of the assessments of the EDBs' pricing methodologies against the Information Disclosure Guidelines. (The detailed assessments are presented in Appendix D).

Section 6 presents an analysis (the detail of which is in Appendix F) of the extent to which EDBs' appear to have considered the Pricing Principles when developing their pricing methodologies, and

[9] Electricity Commission, Feb 2010 http://www.ea.govt.nz/document/3760/download/our-work/programmes/transmission-work/principles-or-model-approaches-to-distribution-pricing/

[10] Details of the full process undertaken by the Electricity Commission to develop the Pricing Principles and Information Disclosure Guidelines can be found on the Electricity Authority website at: http://www.ea.govt.nz/our-work/programmes/transmission-work/principles-or-model-approaches-to-distribution-pricing/

the possible economic efficiency implications arising from EDBs potentially having considered the Principles differently. It includes some suggestions for the type of analysis that might be appropriate for the Authority's 2012 review of the EDBs' pricing methodologies when measured against the Pricing Principles.

Section 7 draws together the key observations of this review, and sets out a series of recommendations for improving the processes around the Principles and the Guidelines that would best facilitate EDBs achieving outcomes that deliver on the intent of the Principles.

3 Regulatory framework

3.1 Development of the Pricing Principles and Information Disclosure Guidelines

The Pricing Principles and Information Disclosure Guidelines were the outcome of a work program initiated by the Electricity Commission. A model approach to distribution pricing was initially proposed by the Electricity Commission – i.e. setting out model tariff derivation approaches. However, following consultation with stakeholders, a principles-based approach was developed. Such an approach was considered to have benefits over a model approach due to the varying characteristics of the different distribution networks, as well as allowing for regulatory consistency with the principles-based approach taken by the Commerce Commission for other related markets, namely the gas distribution market.

The Electricity Commission also developed the associated Information Disclosure Guidelines with the objective of assisting EDBs in how best to disclose information on their pricing methodologies.

The Principles and Guidelines are now under the mandate of the Electricity Authority, following the passage of the Electricity Industry Act 2010. However there has been no change to them, their fundamental objectives, or the intended process for reviewing compliance with them, as outlined in the final paper by the Electricity Commission[11].

The Pricing Principles and Information Disclosure Guidelines are as follows:

Pricing Principles		
(a)	Prices are to signal the economic costs of service provision, by:	
	(i)	being subsidy free (equal to or greater than incremental costs, and less than or equal to standalone costs), except where subsidies arise from compliance with legislation and/or other regulation;
	(ii)	having regard, to the extent practicable, to the level of available service capacity; and
	(iii)	signalling, to the extent practicable, the impact of additional usage on future investment costs.
(b)	Where prices based on 'efficient' incremental costs would under-recover allowed revenues, the shortfall should be made up by setting prices in a manner that has regard to consumers' demand responsiveness, to the extent practicable.	
(c)	Provided that prices satisfy (a) above, prices should be responsive to the requirements and circumstances of stakeholders in order to:	
	(i)	discourage uneconomic bypass;
	(ii)	allow for negotiation to better reflect the economic value of services and enable stakeholders to make price/quality trade-offs or non-standard arrangements for services; and
	(iii)	where network economics warrant, and to the extent practicable, encourage investment in transmission and distribution alternatives (e.g. distributed generation or demand response) and technology innovation.
(d)	Development of prices should be transparent, promote price stability and certainty for	

[11] (Electricity Commission, Feb 2010)

	stakeholders, and changes to prices should have regard to the impact on stakeholders.
(e)	Development of prices should have regard to the impact of transaction costs on retailers, consumers and other stakeholders and should be economically equivalent across retailers.

Information Disclosure Guidelines		
(a)	Prices should be based on a well-defined, clearly explained and published methodology, with any material revisions to the methodology notified and clearly marked.	
(b)	The pricing methodology disclosed should demonstrate:	
	(i)	how the methodology links to the pricing principles and any non-compliance;
	(ii)	the rationale for consumer groupings and the method for determining the allocation of consumers to the consumer groupings;
	(iii)	quantification of key components of costs and revenues;
	(iv)	an explanation of the cost allocation methodology and the rationale for the allocation to each consumer grouping;
	(v)	an explanation of the derivation of the tariffs to be charged to each consumer group and the rationale for the tariff design; and
	(vi)	pricing arrangements that will be used to share the value of any deferral of investment in distribution and transmission assets, with the investors in alternatives such as distributed generation or load management, where alternatives are practicable and where network economics warrant.
(c)	The pricing methodology should:	
	(i)	employ industry standard terminology, where possible; and
	(ii)	where a change to the previous pricing methodology is implemented, describe the impact on consumer classes and the transition arrangements implemented to introduce the new methodology.

3.2 Relationship with Commerce Commission regulation of EDBs

Many aspects of the electricity distribution market are regulated under the Commerce Act 1986[12]. The Commerce Act is administered by the Commerce Commission (the 'Commission).

The Commission has responsibility for regulation relating to aspects such as information disclosure, allowable returns on investment, valuing assets, and tax issues. The Commission also used to have responsibility for oversight of EDBs' pricing methodologies (and indeed continues to do so for gas distribution businesses).

However, the Electricity Industry Act 2010[13] and the Commerce Act 2006[14] recognise that Authority can set a pricing methodology for EDBs. The Commission has not set an input methodology for EDB

[12] Available here: http://www.legislation.govt.nz/act/public/1986/0005/latest/DLM87623.html?search=ts_act_commerce_resel&p=1&sr=1

pricing methodologies[15], although the Commission continues to require EDBs to disclose information relating to their prices under part 4 of the Commerce Act.

To ensure consistency of regulatory outcomes, it is understood that the Authority and Commission are in close dialogue so that the development of pricing methodologies through the Authority's process, is consistent with the regulatory regime administered by the Commission.

The Commission's Information Disclosure Requirements and the Authority's Information Disclosure Guidelines are deliberately very similar, the intention being that EDBs would only have to prepare one set of information to meet the requirements of both agencies.

The Commission is reviewing its Information Disclosure Requirements, and it is expected that the Authority's experience with EDBs' implementation of its Guidelines will inform this process.

The Commission's current Information Disclosure Requirements relating to electricity distribution pricing are outlined in Appendix A.

As mentioned above, the Commerce Commission is also responsible for regulating other markets, including the gas distribution market. The Commerce Act (Vector/Powerco Natural Gas Services) Authorisation 2008 sets out the requirements of gas distribution companies, and includes pricing principles and disclosure requirements for those businesses[16].

These are what formed the basis for the Electricity Authority's Principles and Guidelines, and are hence similar to or the same as the Authority's for the most part. However, the Commission's Information Disclosure Requirements require more information to be disclosed on the derivation of prices and decision process involved, and a template for the disclosure is included.

Appendix B sets out the Commission's requirements in this respect.

3.3 Other Regulatory Requirements

There are a number of other regulatory requirements that EDBs must consider when developing a price structure and setting prices.

3.3.1 Default/customised price-quality path regulation

Under subpart 9 of Part 4 of the Commerce Act 1986, suppliers of electricity lines services are subject to default/customised price-quality regulation, except those suppliers that meet consumer ownership criteria specified in the Act. This means that the Commerce Commission regulates the average prices that EDBs can charge, and the mechanisms by which EDBs may adjust their prices. Specifically, EDBs are generally restricted to raising average prices by no more than CPI +/- x%, and

[13] Available here: http://www.legislation.govt.nz/act/public/2010/0116/latest/DLM2634233.html?search=sw_096be8ed8062360b_lines&p=1

[14] Available here: http://www.legislation.govt.nz/act/public/1986/0005/latest/DLM1685460.html?search=sw_096be8ed8062360b_pricing&p=1

[15] (Commerce Commission, Dec 2010)

[16] See http://www.comcom.govt.nz/assets/Imported-from-old-site/industryregulation/Gas/CommissionReportsandDocuments/ContentFiles/Documents/comcom-decision656powercoauthorisation-oct2008.pdf, and http://www.comcom.govt.nz/assets/Imported-from-old-site/industryregulation/Gas/CommissionReportsandDocuments/ContentFiles/Documents/comcom-decision657vectorauthorisation-oct2008.pdf

any increases relating to pass-through costs from Transpower and Government and regulatory authority levies.

Some EDBs are not required to comply with the default price-quality path regulations if they meet the Act's criteria to be considered as being owned by their customers.

Additional information on the default price-quality paths can be found in the Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper December 2010, available at:

http://www.comcom.govt.nz/electricity-distribution/

3.3.2 Low User Regulations

EDBs must also comply with the Electricity (Low Fixed Charge Tariff option for Domestic Consumers) Regulations 2004. These require EDBs to offer low fixed charge tariffs, with a line charge of no more than 15 cents per day for residential consumers at their primary residence. There are a number of other design features that must be incorporated in these low fixed charge tariffs. These requirements can be viewed in detail at:

http://www.legislation.govt.nz/regulation/public/2004/0272/latest/DLM283614.html

3.3.3 Rural /Urban Prices

The 2009 GPS stated that the Government expected distribution companies to keep any changes to rural line charges in line with changes to urban line charges[17]. However, following the passage of the Electricity Industry Act 2010, the requirements of this GPS no longer apply although a number of EDBs were unaware that this requirement had been repealed.

This means that no formal regulations currently exist relating to urban and rural line charges, though Part 113 of the Act provides for such regulation to be developed if the government requires it.

[17] This had the effect of 'locking-in' existing rural-urban price differentials which meant that any network wanting to move to a more cost reflective pricing approach (i.e. higher rural-urban differentials) was restricted from doing so, despite other networks being able to maintain such an approach if it existed previously.

4 Description of approach

4.1 Determining the type and level of information disclosure required

A key consideration in conducting this exercise is what type of information should be published by EDBs in order to comply with the Guidelines, and to what level of detail?

This has been considered within the wider context of the Electricity Commission (and now the Authority) deciding to use a 'light-handed' regulatory approach to improving distribution pricing consisting of *voluntary* Pricing Principles.

Such a voluntary principles-based approach can only work if there is sufficient information provided to the regulator to enable it to assess that it is achieving the desired economically efficient outcomes – hence the Guidelines.

Accordingly, the type and level of detail required to be published by the EDBs in order to comply with the Guidelines has been interpreted as being that which would be sufficient to enable a suitably qualified expert to undertake a formal assessment of an EDB's pricing methodology to determine whether it achieves the objectives of the Pricing Principles.

This level of information disclosure will necessarily be relatively detailed. However, it is judged that the provision of more information (and of a suitable quality) should reduce the risk to EDBs (and New Zealand more generally) of ill-informed regulatory decisions on pricing approaches which, given that the value of electricity distribution assets is approximately $7-$8 billion, should outweigh the costs of providing such information.

Further, if this voluntary principles plus information disclosure approach is considered not to be working, the counter-factual is not likely to no information disclosure, but rather a move to a more 'heavy-handed' prescriptive regulatory approach to setting distribution pricing methodologies. However, as was established in the original Electricity Commission process, such a prescriptive approach risks inappropriate outcomes that don't appropriately reflect different EDB's situations.

That said, it is also understood that progression towards more efficient pricing methodologies is not going to happen overnight. Rather, it is understood that the Authority considers this process as being a 'journey', and that *two-way* exchange of information between the Authority and EDBs, and between EDBs, is an important aspect of helping EDBs progressively move to more efficient pricing approaches that will deliver the greatest benefit for consumers in the long-term.

Thus, this intent for a collaborative, continual improvement processes, has also been in mind when developing the evaluation criteria and recommendations for possible future improvements to this overall process.

4.2 Detailed assessment methodology

Each EDB has been assessed against each of the Guidelines. This is necessarily a subjective exercise to some degree. However, in order to limit subjectivity and facilitate consistency of evaluation across distributors, a set of detailed evaluation criteria have been developed which set out the type, level, and approach to information disclosure deemed necessary to be judged to have met each Guideline.

As well as qualitatively assessing whether a distributor has met each of the detailed evaluation criteria, a quantitative 'score' has also been applied between 0 and 3 as follows:

- 0 = Not present, or not met.
- 1 = partially met

- 2 = met
- 3 = met well

Such a scoring approach is intended to help facilitate distinguishing between instances where the 'letter' of a Guideline has been met (e.g. some information has been published on a particular aspect, but not to any great detail), and where the 'intent' of the Guideline has been met (i.e. information has been published of a sufficient depth and quality to enable formal assessment of that aspect against the Pricing Principles). It is expected that such an approach will help to distinguish instances of 'best practice' among the nine EDBs, which may then assist EDBs in the preparation of next year's disclosure document.

An overall score for each EDB has also been calculated, being the *weighted* average of the scores for each element of the Guidelines. A weighting has been applied to each part of each guideline to reflect the fact that some Guidelines are likely to be more important for achieving the purpose of the Guidelines and Principles than others. Such weightings are subjective to some degree, but it is considered that those elements of the Guidelines which relate to demonstrating the economic rationale behind a particular pricing approach are more important than other elements of the Guidelines.

The feedback that was received during discussions with the nine EDBs suggested that the level of detail required in the first draft of the criteria was inappropriate, in that the costs of producing such information would likely outweigh any benefit in terms of facilitating improved pricing outcomes. In particular, the first draft requirement that an EDB's chosen methodology for a particular pricing aspect should be compared against alternative approaches was challenged in this respect.

Further, some inconsistencies in the original scoring approach were identified during discussions.

Accordingly, the criteria presented in Table 2 below have incorporated such feedback, as have the detailed assessments for individual EDBs presented in Appendix D.

Also in response to such EDB feedback, the decision has been made to anonymise the scores and associated discussions published in this report. i.e. companies are referred to as 'Company A', 'Company B', etc. rather than actual name. This was because some EDBs questioned whether it would be appropriate to publish such assessments for this particular review, given that EDBs were being scored against evaluation criteria of which they had no knowledge, and it was a matter of luck as to whether they were one of the nine EDBs to be assessed.

Table 2: Assessment criteria for evaluation of alignment with the Information Disclosure Guidelines

Guideline & Breakdown (including weighting)	Assessment criteria
(a) Prices should be based on a well-defined, clearly explained and published methodology, with any material revisions to the methodology notified and clearly marked.	
Methodology is well-defined (100)	A clear objective should be described. All aspects of the methodology which will have a material impact on consumer prices should be clearly described. The various steps required to produce final prices should be logically set out. Our interpretation of the main steps required, and what should be demonstrated in those steps, is set out in Appendix C. The factors considered most significant in determining a particular approach adopted should be discussed. The methodology's suitability for the network, given its characteristics or situation, should be demonstrated, referencing substantiating qualitative analysis where suitable. Any key assumptions that have been used (i.e. values for factors over which there is a material degree of uncertainty and which can materially change prices), should: • Be identified as such; • Reference source material substantiating the values used; and • Indicate the range of uncertainty, and consequential implications of such a range on final prices
Methodology is clearly explained (30)	The methodology is easy to follow and progresses in a logical manner. The document is well structured to aid comprehension. There is discussion to introduce complex concepts or background information, referencing other publically available documents (ideally on the EDB's website) where appropriate.
Methodology is published	The disclosure is published on the company's website. The "best practice" approach would include:

(15)	• the provision of additional customer-oriented material or information on changes/reviews/consultations etc; and • an 'archive' of all previous years' methodologies and associated documents also being provided on the company's website.
Revisions are notified and clearly marked (15)	Any changes that are made to the *methodology*[18] from the previous year are clearly outlined in the document. • If no changes have been made, this is explicitly stated. Ideally, a summary 'running record' of the main changes made to the methodology over past years is published (potentially as a separate document).
(b) The pricing methodology disclosed should demonstrate:	
(b)(i) How the methodology links to the pricing principles and any non-compliance;	
Links to pricing principles outlined (100)	A summary section of the pricing methodology disclosure should identify each of the Pricing Principles, and set out how the pricing methodology achieves each Principle. Supporting quantitative analysis should be provided at a level of detail necessary to demonstrate how the various aspects of the pricing methodology support achievement of the overarching objective of the Pricing Principles – i.e. economically efficient outcomes. This information need not be included within the disclosure itself. Instead, the disclosure could reference external documents or spreadsheets (all of which should also be available on the EDB's website, or other public websites).
Non-compliance identified (30)	Areas that don't comply with the Pricing Principles or where alignment could be improved to further support their over-arching objective are: • Identified; • Reasons for such sub-optimal alignment described; and • Any intentions, or not, to improved such alignment are identified, along with the proposed approach and indicative timeframe.

[18] i.e. as distinct to price level changes within a methodology that has not changed.

(b)(ii) The rationale for consumer groupings and the method for determining the allocation of consumers to the consumer groups;	
Consumer groups are outlined (30)	The segregation of customers into consumer groups is stated. Ideally, this would be set out in a clear table or tree diagram. Metrics or statistics relating to each consumer group should be included. (e.g. contribution to network peak kW demand, sum of individual anytime maximum demands, number of connections, GWh energy demand , connection capacities, value of lost load, etc.,)
Rationale for groupings provided (70)	An explanation for why the groups have been designed as they have should be included, with discussion of: • How the groups relate to cost drivers; • How the groups relate to consumer or network characteristics; and • Any benefits or limitations associated with the groupings (e.g. rural/urban considerations). • This discussion should be supported by quantitative information as appropriate.
(b)(iii) Quantification of key components of costs and revenues;	
Key components of costs included (100)	The costs to be recovered are stated. The description of each line item is clear and explicit. The drivers of the key costs are identified, ideally with analysis presented or referenced setting out how the range of possible outcomes for such drivers over an investment timeframe (i.e. [30] years) will impact on such costs. The cost breakdown is well considered, relating to the method of allocation across consumer groups and/or the drivers of those costs.
Key components of revenues included (50)	The revenue generated across each consumer group is outlined. Ideally, revenue is given at the same level of breakdown as costs are provided, and a comparison between the two set out.

(b)(iv) An explanation of the cost allocation methodology and the rationale for the allocation to each consumer grouping;	
Cost allocation methodology explained (30)	The metrics used to allocate costs are outlined. The allocation of each cost item is shown across the groups.
Rationale provided (70)	The reasons for the use of each chosen metric are discussed. The implications or benefits of the use of those metrics are discussed.
(b)(v) An explanation of the derivation of tariffs to be charged to each consumer group and the rationale for the tariff design;	
Tariff derivation is explained (50)	The methodology should clearly explain the different elements of the tariff structures including: – The different types of charge (e.g. fixed charges (and whether per ICP, or per kVA connection capacity, etc.), variable kWh charges, capacity charges, etc.) – Application of any time-based measurement criteria (e.g. different prices at different times of the day or year; assessment of demand based on anytime maximum demand or coincident peak demand, etc) – The nature of any discount for controlled tariffs – 'ICP-pricing' or 'GXP-pricing' approaches
Rationale provided (100)	The reasons for the tariff structure should be set out, including description of: • How the tariff structure and levels are linked to the key cost drivers identified, with quantitative comparisons provided; • How the tariff design will further the achievement of the objective of the Pricing Principles (i.e. economically efficient outcomes); and • Any other material considerations taken into account when developing the tariff structure.
(b)(vi) Pricing arrangements that will be used to share the value of any deferral of investment in distribution and transmission assets, with the investors in alternatives such as distributed generation or load management, where alternatives are practicable and where network economics warrant.	
Pricing arrangements	The nature of any such arrangements should:

outlined (70)	• Be clearly described; • Reference relevant supporting analysis for deriving the value of any such payments or discounts for such alternatives, particularly how such payments/discounts relate to cost drivers; and • Describe any other material considerations taken into account when developing such arrangements (e.g. arrangements relating to section 54Q of the Commerce Act)
(c) The pricing methodology should:	
(c)(i) Employ industry standard terminology, where possible; and	
Industry standard terminology used (10)	The disclosure should use industry standard terminology. Ideally, a glossary should be provided (or referenced) explaining the meaning of terms, and possible alternative terminologies that are known to have been used to describe the same aspect.
(c)(ii) Where a change to the previous pricing methodology is implemented, describe the impact on consumer classes and the transition arrangements implemented to introduce the new methodology.	
Impact described (10)	If changes to the methodology have occurred: • The reasons for any changes are discussed; and • The effect this has on prices for customers, in terms of size and duration, is discussed and quantified if possible.
Transition arrangements discussed (10)	If changes have occurred, any arrangements to 'phase-in' the effects of those changes are discussed.

5 Assessment of EDB's consistency with the Information Disclosure Guidelines

The detailed assessments of EDBs' pricing methodologies against the Guidelines, which have been revised following the feedback from the EDBs, are presented in Appendix D. This section presents the summary of such detailed evaluations.

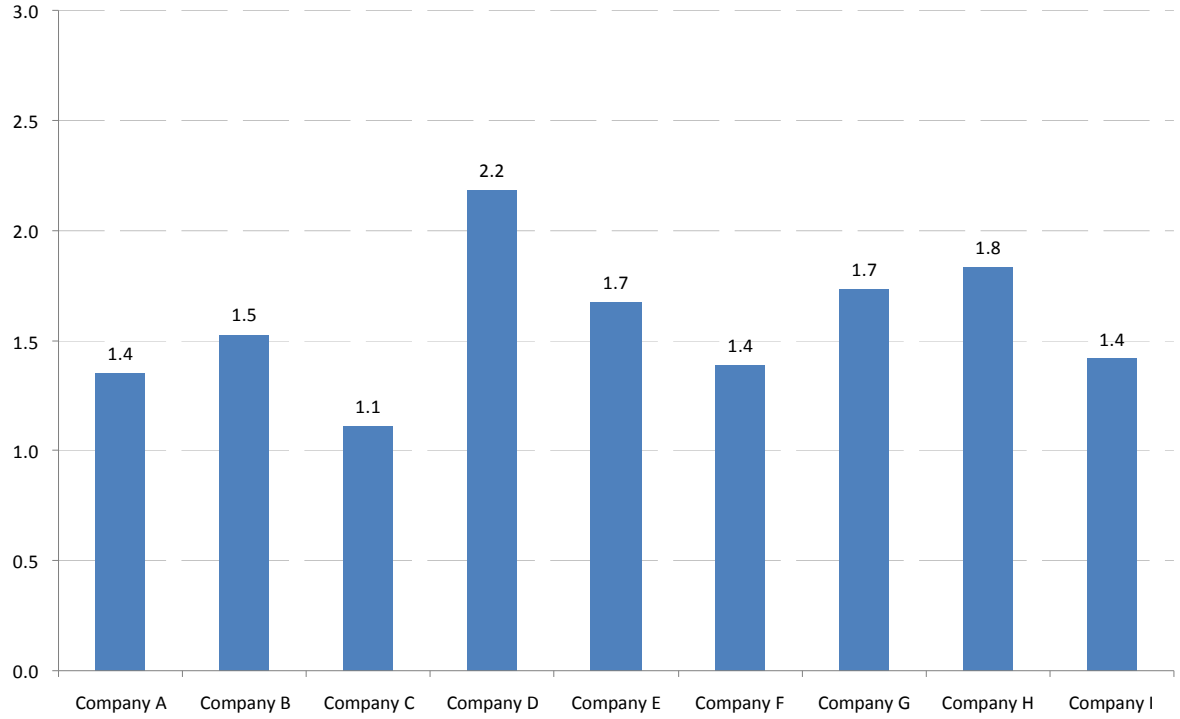
5.1 Summary of EDB scores

Table 3: Summary evaluation of all EDBs against Guideline criteria

Guideline	Weighting	Company A	Company B	Company C	Company D	Company E	Company F	Company G	Company H	Company I	AVERAGE
(a) Prices should be based on a well-defined, clearly explained and published methodology, with any material revisions to the methodology notified and clearly marked.											
Methodology is well-defined	100	1.5	1.0	0.5	2.5	2.5	1.0	2.0	2.0	1.0	1.6
Methodology is clearly explained	30	1.5	2.0	0.5	2.5	1.5	2.0	2.0	2.0	1.5	1.8
Methodology is published	15	2.0	2.5	2.0	2.5	3.0	2.5	2.0	2.0	2.0	2.3
Revisions are notified and clearly marked	15	2.0	2.5	2.0	2.5	1.0	1.0	1.0	2.0	2.5	1.8
(b) The pricing methodology disclosed should demonstrate:											
(i) How the methodlogy links to the pricing principles and any non-compliance											
Links to Principles outlined	100	1.5	1.0	1.0	1.0	0.5	1.0	1.0	1.0	1.0	1.0
Non-compliance identified	30	1.5	1.0	1.0	1.0	1.5	2.0	2.5	2.0	1.0	1.6
(ii) The rationale for consumer groupings and the method for determinging the allocation of consumers to the consumer groups;											
Consumer groups are outlined	30	1.5	2.5	2.0	3.0	2.0	2.5	2.5	2.5	1.5	2.3
Rationale for groupings provided	70	1.0	1.5	1.0	2.5	1.0	0.5	2.0	2.0	1.5	1.4
(iii) Quantification of key components of costs and revenues;											
Key components of costs included	100	1.5	1.5	1.0	2.5	2.0	1.0	2.0	2.0	1.5	1.7
key components of revenues included	50	2.0	2.0	2.0	2.0	1.5	2.0	2.0	2.5	2.0	2.0
(iv) An explanation of the cost allocation methodology and the rationale for the allocation to each consumer grouping;											
Cost allocation methodology explained	30	1.5	1.5	1.5	2.5	1.5	2.5	2.0	2.5	2.0	1.9
Rationale provided	70	0.5	1.5	0.5	2.0	1.0	2.0	1.5	2.0	1.5	1.4
(v) An explanation of the derivation of tariffs to be charged to each consumer group and the rationale for the tariff design;											
Tariff derivation is explained	50	1.0	2.0	1.5	2.5	1.5	1.5	1.5	2.0	1.0	1.7
Rationale provided	100	1.0	1.5	1.0	2.5	2.5	1.0	1.5	1.0	1.5	1.5
(vi) Pricing arrangements that will be used to share the value of any deferral of investment in distribution and transmission assets, with the investors in alternatives such as distributed generation or load management, where alternatives are practicable and where network economics warrant.											
Pricing arragements outlined	70	1.5	1.5	1.5	2.0	2.0	1.5	1.5	2.0	1.5	1.7
(c) The pricing methodology should:											
(i) Employ industry standard terminology, where possible; and											
Industry standard terminology used	10	2.5	2.5	2.0	2.5	2.0	3.0	2.0	2.5	2.0	2.4
(ii) Where a change to the previous pricing methodology is implemented, describe the impact on consumer classes and the transition arrangements implemented to introduce the new methodology.											
Impact described	10		2.0						1.5		1.8
Transition arrangements discussed	10		1.5						1.5		1.5
Weighted average score		1.4	1.5	1.1	2.2	1.7	1.4	1.7	1.8	1.4	1.6

On a weighted average basis, the average score across all nine EDBs was 1.6 out of 3 – i.e. just over half of the maximum possible score. Only Company D managed to score materially above this with a weighted average score of 2.2. The highest scores are shown in red against each criterion.

Figure 1: Weighted average total scores for all EDBs



5.2 Qualitative evaluation of EDBs' application of the Guidelines

This section discusses the main observations regarding the EDBs' performance against each of the Guidelines.

(a) Prices should be based on a well-defined, clearly explained and published methodology, with any material revisions to the methodology notified and clearly marked

There was a range of scores achieved against this Guideline. The requirement for a "well-defined" methodology was the main factor influencing these scores. In that respect, those EDBs that provided stronger justification for their approach generally scored more highly.

Overall, the nine EDBs generally provided reasonable information about *what* had been done in their pricing methodology. However, there was often little information as to *why* a particular approach was chosen. This was especially the case for why the EDB had chosen a particular tariff structure (as distinct to why the EDB had chosen a particular customer grouping or cost allocation approach).

The most significant omission in terms of methodological steps was explicit consideration and quantification of the cost drivers of the EDBs' businesses. Company D and Company E were the most significant exceptions to this. It was generally observed that where this information was not well developed, subsequent rationales for other aspects of the pricing methodologies (particularly tariff structures) also appeared to be not well developed.

Where rationales were given for why a particular approach was chosen, these were generally qualitative in nature with little or no quantitative analysis presented or referenced to substantiate why a particular approach chosen. Again, this was particularly the case for tariff structure rationales.

This lack of information as to why a particular pricing approach has been adopted will make it hard for the Authority to undertake its review in Autumn 2012 to determine whether the various EDBs' tariff structures are consistent with the Principles.

This Guideline also requires that the methodology disclosure is clearly explained. Those disclosures that had explicit, targeted discussion under dedicated sub-headings, with a logical flow, were generally easier to follow.

All of the nine EDB's disclosures were published on their company website, and hence were considered to have met this aspect of the Guideline. Where additional supporting information, or simplified information targeted at consumers, was provided, the benefit of this was acknowledged by a higher score, suggesting they had met the criteria well.

Finally, the Guideline requires disclosures to notify and mark any material revisions to the methodology. While some EDBs objected to being marked against this criteria having not made any revisions, and hence not having mentioned this fact, it was considered good practice to clearly outline whether changes had actually occurred *or not*, for two reasons:

- Price *level* changes occur regularly, and it is desirable to be clear whether *methodology* changes have contributed to those changes; and
- As the publication of the Principles and Guidelines is intended to initiate a gradual transition towards more economically efficient prices, it is likely there will be a greater interest in building up a picture of these changes over time. This also gives rise to the best practice approach of including a running record of methodology changes.

It is noted that such a requirement is not particularly laborious, and was included by the majority of EDBs.

(b)(i) The pricing methodology disclosed should demonstrate how the methodology links to the pricing principles, and any non-compliance

All of the EDBs achieved similar scores for this Guideline, with each including a separate section in their methodology disclosure that specifically outlined areas where their pricing methodology complied with the Principles. Generally speaking, these sections all contained similar information, to a similar degree of detail, and all EDBs stated that they believed they were compliant.

However, it was considered that the information presented in response to this Guideline was generally not of a level that would support this intent. There was very little analysis presented by any of the EDBs to demonstrate the *extent* of their alignment with the Principles, visually or otherwise (Company A was the main exception to this, with some graphical demonstration of the consistency of the methodology against the Principles – although even this information provision was partial).

In addition, section 6 sets out some simple analysis which demonstrates that the different EDB's price structures are resulting in very different price signals to consumers, which could potentially be resulting in material differences in the economic efficiency of outcomes. However, there is insufficient analysis or information provided or referenced within the EDBs' Pricing Methodology disclosures to determine whether the significant differences in observed outcomes are appropriately reflective of significant differences in the characteristics of the EDBs' networks, or otherwise suggest that some EDBs are less aligned with the Principles.

Further, during discussions with the EDBs, some indicated that, while they had stated that they were compliant with the Principles, there were external factors inhibiting their ability to introduce what they felt were more cost reflective and economically efficient pricing approaches. For example:

- One EDB undertook a detailed analysis in 2000 which identified that moving to GXP pricing would deliver superior price signals to consumers, particularly around signalling the costs of consumption at peak demand. However, they were prevented from implementing this after being taken to court by the main retailer who objected to such a change.
- One EDB indicated there were major distortions in terms of urban customers cross-subsidising their rural customers (approximately 20% of their customers were responsible for 80% of the network), but there was no price differential between such customers to reflect this fact, and they felt constrained in their ability to address such changes due to previous rural-urban regulatory requirements.

Similarly, a number of EDBs indicated that they felt there were asymmetric risks associated with implementing pricing methodology changes due to the application of the Commerce Commission's price control regime, which would likely impact on their 'willingness' to undertake such changes[19].

Therefore, to at least some degree, it appears that economically efficient outcomes (which is the overriding intent of the Principles) are not being achieved, without this being evidenced in the methodology disclosures.

Considering all of the above, EDBs that scored higher against this Guideline generally did so because areas were outlined where alignment was not as strong or future work was planned, leading to higher scores under the 'non-compliance' criterion. Including this information, or alternatively, explicitly stating that it is not required because economically efficient outcomes are being achieved as far as is practical, helps to demonstrate the EDB's position with regard to the Principles, and hence achieve the intent of this Guideline.

(b)(ii) The pricing methodology disclosed should demonstrate the rationale for consumer groupings and the method for determining the allocation of consumers to the consumer groups

Most EDBs were considered to have done well at outlining *what* the consumer groups are, and what consumers belong to each group, with many making good use of tables and visual aids. However, the information on *why* particular groupings were used was frequently limited.

There was observed to be a significant diversity in consumer grouping approaches among the different EDBs. No analysis has been done in this report to determine the extent to which the differing approaches reflect differences in the network characteristics, but it is possible that the range of approaches may also indicate some inconsistency in how the different EDBs have considered the Principles.

Therefore it was considered important that an explanation as to why the approach used is appropriate for that network was well developed in the pricing methodology document. In this regard, as stated in section Appendix C, it was expected that the cost drivers would significantly influence the consumer grouping approach used, and that this relationship would be outlined.

For example, one EDB's stated rationale for their consumer grouping approach for their network is simply the differences in capacity provided on the distribution network.

[19] I.e. any change to a pricing methodology introduces uncertainty with regards to how much revenue an EDB will earn relative to target, as there is little experience with regards to how consumers will respond to such changed price signals. There appears to be a perception that regulatory treatment of any consequent 'over-charging' would be treated differently to 'under-charging' such that, on balance, an EDB will under-recover relative to target.

This compares to Company D, which provided a rationale for each individual group (scoring more highly as a result).

The rationale provided by Company D for all their customer groupings provides a clear picture of the impact that this particular consumer group has on the network, and explicitly links to their stated cost drivers and considerations of the use of shared assets.

It is acknowledged that some EDBs have a greater number of consumer groups, and hence such a level of detail may not be practical for each group – although explanation as to why they have felt the need to have so many consumer groups would be appropriate. However, this Company D extract gives an example of the type of information that can provide strong justification for a given approach, and help demonstrate its suitability for the network.

From discussions with EDBs, and from some indications within some Pricing Methodology documents, it appears that 'historical inertia' (in terms of not wanting to move away from historic approaches because of the consequential bill impacts on customers) was a key factor driving many current customer grouping approaches – i.e. they are the continuation of historic approaches. While avoiding bill impacts and delivering consistent price signals are desirable objectives in themselves, it is felt that such objectives should be explicitly mentioned, and used to help evaluate the trade-off between continuing with a current approach and potential economic efficiency gains from moving to a new approach.

(b)(iii) The pricing methodology disclosed should demonstrate quantification of key components of costs and revenues

Generally speaking, all EDBs provided an adequate breakdown of their costs, and the revenues retrieved across the consumer groups. Those that gave their cost breakdown at a level that was related to their cost drivers or allocation method were considered to have met this particular criterion better, as this illustrated that the cost breakdown had been communicated as being part of a larger overall process to achieve the objectives of the Principles.

The main factor influencing the scores against this Guideline was whether cost drivers were adequately identified. Generally, EDBs performed poorly on this aspect. Information provided on cost drivers was commonly limited to passing references, with no substantiating quantitative evidence provided or referenced. Company D and Company E were the main exceptions to this, in that they were the only EDBs to present reasonable quantitative information[20]. Company D was also the only EDB that explicitly included "establishing the cost drivers" as an explicit methodological step in their overall pricing methodology approach.

It is considered that cost drivers should be a key underpinning for a pricing methodology.

Qualitatively all EDBs appeared to generally consider that peak demand was the most significant cost driver in their business[21]. However, the analysis set out in Appendix F shows that this has led to far from consistent signals at times of peak, potentially suggesting that the Principles have not been consistently applied. This potential contradiction has generally not been acknowledged or explained.

One apparent difference among the EDBs appears to be the extent to which they view their costs as being fixed or variable. Some have stated that their costs are largely fixed, whereas others have stated that they consider a significant proportion of their costs to be variable over the long-term.

[20] Company A were the only other EDB to provide some quantitative information, but not as much as Company D and E.

[21] The key EDB statements on this issue are grouped together in Appendix E.

Generally, this appears to have had a significant influence on the resulting tariff structures, with potential economic efficiency impacts. This is explored in more detail in Appendix F.

(b)(iv) The pricing methodology disclosure should demonstrate an explanation of the cost allocation methodology, and the rationale for the allocation to each consumer grouping

There was generally good information provided about *what* approach was used to allocate costs among consumer groups, but much less information provided about *why* the particular approach was adopted.

Again, the cost drivers are expected to materially influence how costs are allocated across the groups, with each cost component being allocated based on a measure that relates to the generation of that cost.

There was a range of cost allocation methods used between the different EDBs. Some allocated the value of assets across consumer groups using a quantifiable metric then used this to allocate components of costs. Others directly allocated costs based on a quantifiable metric. There was also a range of metrics used among the EDBs to allocate similar costs or assets. For example, for those that allocated assets across the groups, shared assets were treated differently.

EDB	Statement regarding shared asset allocation
Vector	*"Assets have been apportioned based on end consumer demand and distance. These inputs have been used as they determine the size and length of distribution cable or line to install and hence determine the overall cost."*
Unison	*"Where assets are shared by consumers, allocation of the asset value to each consumer is in proportion to their AMD compared to the total AMD of all consumers using that asset."*
Orion	*"The allocation of assets that are largely shared (e.g. sub-transmission assets) is weighted more in favour of each category's contribution to local peak demands (ADMD) on the basis that these assets are sized to meet the combined coincident loadings."*
Horizon	*"The sub transmission, zone substation, urban distribution and rural distribution assets are shared between urban and rural domestic, urban and rural capacity, NMD and special load groups on the basis of the anytime maximum demand of each load group."*

Clearly this highlights that the allocation process involves some subjective judgement, resulting in a different approach by each EDB. However, it was considered that this judgement process was not well demonstrated, and the extent to which it is affected by differing cost drivers or network characteristics, or may otherwise represent differences in the level of economic efficiency achieved, is left to question.

Verbally a number of EDBs indicated that different consumer grouping & cost allocation approaches were unlikely to result in material differences in the economic efficiency of outcomes. The basic analysis presented in Appendix F suggests that it is possible for this to be the case, but likewise it is also possible for some particularly 'extreme' consumer grouping & cost allocation approaches to have material economic efficiency impacts.

Another important issue arising during this review is that, as discussed previously, a number of EDBs verbally stated that they were constrained in their ability to cost-reflectively allocate costs. This was particularly evident with regard to urban and rural customers, where a significant level of cross-subsidisation may occur. However, in general, little information was provided about the nature and scale of such outcomes, or discussion of the possible implications of such approaches.

Further, with the rural-urban provisions in the 2009 GPS no-longer in effect, and no specific regulations having been implemented via section 113 of the new Act to replace them, there appears to be some uncertainty among EDBs with regards to the policy intent of the current government with respect to rural-urban matters.

(b)(v) The pricing methodology disclosed should demonstrate an explanation of the derivation of tariffs to be charged to each consumer group and the rationale for the tariff design

This is an area where there was significant variation in observed approaches. Generally, EDBs provided little substantiating quantitative evidence to support their approach. The main exceptions to this were Company D and Company E who explicitly set out how their pricing structure was driven by cost-drivers. They also provided the greatest amount of supporting quantitative analysis.

Further, there was significant variation in the qualitative rationales provided for the EDBs' chosen approaches. Some (notably those who had strong price signals at times of peak demand) placed a strong focus on their cost drivers when designing their tariff structures, whereas others appeared to place greater weighting on other considerations. Comparison of the stated rationales from two EDBs who sent very different peak price signals illustrates the extent of this variation.

The stated approach from the EDB which sent very strong peak price signals noted that:

- the most significant cost driver influencing delivery service is the combined peak demand of all consumers (ADMD) as the network is designed and constructed to meet this combined peak load.
- approximately 50% of its distribution costs are directly dependent on peak loading (the remaining costs are either fixed or dependent on the peak demand of individual consumers or groups of consumers.
- To reflect the ADMD cost driver in its pricing, a long run average incremental cost (LRAIC) of delivery during peak loading periods has been derived and is reflected in its pricing.
- The LRAIC is the replacement cost of the proportion of its distribution assets that is load dependent, divided by the peak demand. Apart from minor differences due to the unit and point of measurement, the LRAIC is calculated on an equivalent basis for all relevant connection categories.
- The residual revenue requirement [for general connections] for both distribution and transmission is collected through volume charges, structured to reflect the value of our service to each consumer.
- A day/night differential is applied to reinforce the peak based pricing incentive and encourage better utilisation of its network. Using energy volumes also supports compliance with low fixed charge regulations.

The approach from the EDB which had relatively weak peak price signals noted:

- It is not practical to take all of the different cost drivers into account in designing network prices and a degree of averaging in developing prices to recover the overall costs is required. Information on end consumer response to prices is highly uncertain. The pricing approach is therefore limited to reflecting the key cost concepts.
- Its price structure has focussed on:
  - Cost reflectivity in the design of service classes;
  - Incentives for retaining and attracting end consumers, including appropriate fixed/variable splits;
  - Stability.
- It seeks the following outcomes:
  - Recovery of regulated revenue;
  - Encourage dynamically efficient use of the existing sunk network by making it attractive to maintain connections and for new end consumers to connect;
  - End consumers are not artificially incentivised to shift costs on to other consumers by gaming the pricing;
  - Cost-reflective charges that recover the cost of the shared network and reflect end consumers' propensity to pay; and
  - Manage rate shock when changes are required.

Thus, it appears the second EDB has only sought to have cost-reflectivity drive its approach in the design of service classes – i.e. establishing the consumer groupings. However, with respect to the design of tariff structures, the above statements appear to suggest that reflecting cost drivers is not the driving factor. Instead, retaining and attracting end consumers appears to be key.

This appears to contrast with the first EDB's approach, where cost drivers appear to be a key determinant of both their consumer grouping choice and its tariff structure approach.

Whereas the first EDB provides considerable evidence of the extent to which reflecting cost drivers in tariff structures could result in material changes to future distribution costs, this is not presented in the other EDB's methodology document – or indeed most other EDBs' methodology documents.

No analysis has been done for this review on the extent to which these different approaches by the two EDBs may reflect fundamental differences in the network situations. (For example, such a difference in approach could be economically efficient if the first faced network capacity constraints, whereas the second had little requirement to make investments to meet demand growth for the foreseeable future).

However, Appendix F illustrates the implications of these different pricing approaches in terms of the nature and scale of price signals for end customers. It also highlights the extent to which some EDBs appear to have significant apparent inconsistencies in their pricing approaches between customers with respect to signalling cost drivers, and the economic efficiency that can be gained by the industry through tariff structures that closely align with cost drivers.

(b)(vi) The pricing methodology disclosed should demonstrate pricing arrangements that will be used to share the value of any deferral of investment in distribution and transmission assets, with the investors in alternatives such as distributed generation or load management, where alternatives are practicable and where network economics warrant.

The majority of EDBs stated that they had some form of arrangements in place to share the value of deferred investment. Most commonly these involved controlled and/or peak/night tariffs.

Generally speaking however, the discussion around these arrangements was brief and/or under-developed. Some EDBs failed to mention them at all outside of the dedicated section discussing alignment with the Principles. It was considered that further information regarding these tariffs could have been provided / referenced, particularly including:

- Any factors influencing the decision to send (or not) such signals;
- The strength of the signals provided to customers;
- How the magnitude of the tariff signals was chosen;
- The extent to which consumers had responded to the signals provided; and
- The success of the arrangements in terms of growth at peak or asset investment.

The Principles are heavily focussed on economic efficiency, which controlled/peak/night tariffs are specifically intended to improve. Because of this, it was expected that they provided a good opportunity to highlight the extent to which the EDBs are actively pursuing such economic efficiency.

Some EDBs also provided information on arrangements for embedded generators. Again, for the most part the discussion was very brief and could have been built on in a somewhat similar vein to the above.

Ultimately the lack of information that was provided on these pricing arrangements would make it extremely difficult to draw any conclusions in a review of alignment with the Principles.

(c)(i) **The methodology should employ industry standard terminology, where possible**

It was difficult to score against this Guideline, as there is no formal definition for what "industry standard terminology" is. All of the EDBs used terminology that was appropriate for a pricing methodology disclosure, and hence all were considered to have met this Guideline.

In some instances, there were examples of different EDBs using different terminology for the same concept, for example; "after diversity maximum demand" and "coincident peak demand". It is not deemed appropriate to form a view as to which, if any, is the preferred terminology as part of this review. Ultimately it is considered that any terminology 'standard' would best be developed by the industry itself.

For completeness' sake, given that the disclosures are made available to consumers, instances of best practice have been signalled where a glossary has been included or referenced, or complex terms and acronyms have been explained. The majority of EDBs had provided such material to some degree. However, the low weighting for this Guideline means that it is not considered that the requirements under this Guideline have a particularly strong influence on the overall achievement of the desired outcomes.

(c)(ii) The methodology should, where a change to the previous pricing methodology is implemented, describe the impact on consumer classes and the transition arrangements implemented to introduce the new methodology

It is apparent that a number of EDBs' tariff structures have changed little over the years. Those that had not had any changes since the previous year were not assessed against this Guideline.

Only two EDBs had made methodology changes in 2011. Company B provided some useful tables quantifying the resulting effects on the number of consumers in each group, and the change in consumer tariffs. Consequently, Company B scored relatively well against this criterion. Additionally, both of these EDBs discussed their policy of reducing price shocks to customers by limiting price changes to 10% per year.

It was considered that further information regarding methodology changes could have been usefully provided, including:

- Information signalling the possible length of the transition period, and any factors influencing this;
- Information regarding the total magnitude of the change, if it was being phased in progressively; and
- Discussion or analysis (presented or referenced) suggesting why 10% was an appropriate level for limiting price changes in a given year.

As the Principles and Guidelines encourage further changes by EDBs towards more economically efficient pricing, information provided under this Guideline is likely to be of increased interest.

5.3 Other outcomes from the review process

It is important to note that the *process* of the review is considered to have led to positive outcomes including:

- The two-way nature of information flow is considered to have helped both parties gain a better understanding of the various issues. i.e. the face-to-face and teleconference meetings were valuable aspects of the review from the reviewer's perspective, and appeared also to be for the EDBs themselves based on feedback they gave.
- Greater awareness among the EDBs of the pricing approaches adopted by *other* EDBs. This was highlighted by a number of the EDBs as being useful, and helped them in their consideration of their own pricing approaches;
- Highlighting examples of best practice by particular EDBs in relation to the various Guidelines and criteria. Again, this was suggested as being helpful by a number of EDBs in terms of considering changes to their own approaches; and
- Creating a healthy 'competitive tension' among EDBs in terms of wanting to score well relative to their peers. This was highlighted by a number of EDBs as being a good thing, with parallels being drawn with similar such outcomes in relation to the publication of Asset Management Plan evaluations that the Commerce Commission undertakes.

Such outcomes have been factored into the recommendations set out in section 7.

However, with respect to the last bullet point, a number of EDBs questioned whether it would be appropriate to publish the detailed scores for this particular review, given that EDBs were being scored against evaluation criteria of which they had no knowledge and it was a matter of luck as to

whether they were one of the nine EDBs to be included in this review. Accordingly, the Authority decided not to publish the scores.

While there would appear to be no reason to 'anonymise' the scores of the EDBs for any future such reviews, it can be understood why EDBs who scored relatively poorly for this review may feel aggrieved if the detailed scores were published.

6 Analysis of EDBs' consideration of the Pricing Principles

6.1 Purpose

Two of the key objectives of this review were:

- to assess whether the EDBs have *considered*[22] the Principles in developing their tariff structures; and
- to develop a series of recommendations for improving the Principles, Guidelines, or supporting material published by the Authority.

During the course of the review, three of the key issues that emerged were:

- While all nine EDBs explicitly stated that their pricing methodologies *are* consistent with the Principles, there is a significant variety in the pricing methodologies that they have adopted;
- Many EDBs questioned the benefit of them being required to publish detailed information about their pricing methodologies; and
- All EDBs sought early indication of the type of assessment the Authority would be undertaking for the 2012 review in order that they had sufficient time to prepare.

Given the two review objectives and three issues identified above, some relatively simple high-level qualitative and quantitative analysis was undertaken to inform consideration of:

- Whether the EDBs appear to have consistently considered the Principles
- The potential economic efficiency implications of the different pricing methodology approaches, (given that the intent of almost every single Principle is about maximising economic efficiency); and thus
- What might be useful evaluation criteria for the 2012 review, and thus how much detailed information should EDBs be required to produce?

With respect to this last point, producing *detailed* recommendations regarding the evaluation criteria and approach that should be used for the 2012 review was out of scope for this particular exercise. Nonetheless, some suggestions for the general *type* of analysis that may be appropriate was developed.

6.2 Results

The detailed description of the analysis is set out in Appendix F.

The key conclusions from this analysis are:

- The different pricing methodologies *are* resulting in materially different outcomes with respect to the nature and scale of price signals to consumers
- There appears to be some correlation between networks with a sharp peak price signal (e.g. Company D) and the rate of peak demand growth. However, given the high-level nature of the analysis, it is not possible to definitively reach such a conclusion;

[22] As set out in section 2, consideration of whether EDBs' pricing methodologies *are* consistent with the Pricing Principles is not within the scope of this review. (That will be the subject of the second review to be undertaken in Autumn 2012).

- It is possible such differences in pricing approaches may reflect fundamental differences in the circumstances of the different networks, although high-level evaluation set out in Appendix F suggests this may not be a key factor in many situations.
- To the extent such pricing difference aren't appropriate reflections of particular network circumstances, the analysis indicates that the scale of potential economic inefficiencies could be significant.

In other words, the analysis suggests that EDBs may be considering the Principles inconsistently, and the consequences of such inconsistent application could be material.

The analysis further suggested that the outcomes that are potentially inconsistent with the Principles are principally associated with the different approaches to tariff structure (particularly peak pricing approaches, and fixed charge vs. variable charge pricing approaches), but that the different approaches in relation to consumer grouping and cost allocation are less likely to result in significant economic inefficiencies.

6.3 Suggestions of the type of analysis EDBs should include/reference in their disclosures

Based on the analysis set out in Appendix F, the following suggestions have been put forward as the types of analysis that could most usefully be undertaken by EDBs, and included or referenced in their methodology disclosures, in order to help the Authority determine the extent to which an EDB's pricing methodology is consistent with the Principles.

6.3.1 Analysis of EDBs' costs

It is suggested that EDBs should be required to demonstrate the nature and scale of their key cost drivers over an investment timeframe (i.e. 20-30 years) including:

- Network peak demand (including analysis of the extent to which local network peak may be different from regional transmission peak)
- The size of customers' connections
- Customer location / density
- Network topography (e.g. potential issues from 'challenging' rural terrain, or undergrounding issues associated with urban networks)
- Any other key driver identified by the EDB as materially impacting on their costs.

In other words, analysis should be presented which indicates how the EDB's costs would likely change over an investment timeframe based on changes to the key cost driver.

Such analysis should help inform consideration of the appropriateness of customer grouping & cost allocation approaches, and tariff structure approaches.

6.3.2 Customer grouping & cost allocation approaches

It is suggested that EDBs should be required to demonstrate that their chosen consumer grouping & cost allocation approaches:

- do result in prices being 'subsidy free' – i.e. 'equal to or greater than incremental costs, and less than or equal to standalone costs'; and

- do not result in the variable[23] prices to consumers being at materially different levels to the underlying values for the cost-drivers.

Given that the range encompassed by 'incremental' to 'standalone' is so broad that it is likely to capture the vast majority of cost allocation approaches, it is likely that the second bullet point will be significantly more important in terms of achieving economically efficient outcomes consistent with the intent of the Principles.

That said, where EDBs are aware of significant levels of cross-subsidy (e.g. due to historic decisions relating to rural-urban factors, which a number of EDBs indicated were significant on their networks), it is suggested that EDBs provide information on the scale of such effects. This is because it is understood there is considerable variation between EDBs regarding rural-urban pricing approaches, and the provision of such information would facilitate provision of guidance by the Government or Authority if that was judged to be desirable.

Similarly, any other regulatory constraints on the ability of EDBs to achieve pricing approaches that best meet the intent of the Principles should be highlighted.

It is further suggested that EDBs should be required to provide some analysis of the extent to which they have considered the transaction cost implications from the complexity / simplicity of their chosen approach, and any trade-offs between achieving transaction cost savings through simplicity and potential economic impacts from altered consumer outcomes from such simplicity (e.g. altered customer location decisions).

6.3.3 Tariff structure approaches

It is suggested that analysis of the extent to which the different EDBs' costs are driven by peak demand, and comparison with the price signals sent by such EDBs to their different customers at such peak periods, should form a key element of the 2012 review.

With respect to the balance of fixed and variable costs, it is suggested that EDBs be required to:

- present analysis which indicates the extent to which they have knowingly variablised for charging purposes, costs which should be considered fixed, or vice versa; and
- to the extent that they have over / under-variablised charges, EDBs should present analysis justifying such an approach.

In this respect, the EDBs' Transpower costs should be included in this analysis.

6.3.4 'Transition' approaches

Some EDBs have implemented an approach which 'transitions' a price change over a series of years (e.g. some EDBs appear to have approaches where they try and limit the magnitude of price change to customers to being no more than 10% per year).

Accordingly, it is suggested that EDBs be required to set out the rationale for any such approach, including how the benefits of such an approach (i.e. limiting price shocks) have been weighed up against the costs (i.e. delay to sending efficient price signals, and lack of consistency of price signals).

6.3.5 Summary of suggestions of type of analysis required

Most of what has been suggested is similar to the methodological requirements and pricing methodology report template published by the Commerce Commission in relation to gas distribution businesses. (i.e. Schedule 3 Part 2 and Schedule 4 of the Commission's document, which is repeated in Appendix B of this report).

[23] Noting that 'variable' should also encompass all $/kW or $/kVA capacity-based charges over which consumers have the ability to influence the level of such charges based on their behaviour.

The main differences between what has been suggested above, and what the Commission has set out are:

1. The description of the type of key issues identified and suggested associated analysis required, set out above, is more specific in some areas than in the Commission's document which talks more in terms of the general nature of principles and approaches to consider;
2. The Commission's document requires more information on the price-quality trade-off associated with investment.

With respect to the first point, it is suggested that the Commission's approach is more appropriate for a 'standing' document, and it is suggested that the Authority work with the Commission to develop standing documents on such matters which are consistent with each other in this respect. (Indeed, it is understood that such an approach is already underway).

However, such a standing document could be usefully supplemented by specific guidance (e.g. in the form of 'position papers', or the like) on key issues that have been identified for the respective electricity and gas sectors. Accordingly, it is suggested that the Authority could usefully provide guidance, similar to that set out in the previous sub-sections, on the specific types of analysis it intends to undertake for the 2012 review and any subsequent reviews.

With respect to the second point, consideration of price-quality trade-off issues is not part of the Authority's regulatory mandate with respect to distribution pricing, but instead falls under the Commission's purview. As such, it would not appear to be appropriate for the Authority to require such information.

However, to the extent the Commission requires such information, there may be merit in the Authority and Commission working to develop a joint information disclosure document that covers both their requirements, rather than have EDBs incur the cost of unnecessary overlap and duplication of effort from two such disclosures.

7 Summary recommendations

1) It is not recommended that the Principles or Guidelines themselves need revising.

In this respect, although some aspects of the Principles are relatively 'broad' and thus could potentially result in a wide range of pricing approaches being deemed consistent with the Principles, this is an inherent issue with any principles-based approach, and not necessarily an issue with the specific Principles in question. Indeed, it is hard to see how the Principles could be more specific with respect to defining the 'best' approaches, without entering the realms of prescriptive specification of methodologies. This is a view that was shared by all nine EDBs who considered that they were appropriate.

2) The Authority should publish two sets of more detailed evaluation criteria which the Authority will use to assess EDBs for future reviews: one set for assessment against the Guidelines, and one set for the Principles.

As well as providing useful guidance to the EDBs about the nature of the information they need to provide, such detailed criteria should help further clarify the nature of the desired outcomes the Authority is seeking to achieve, without resorting to prescription about particular pricing methodologies.

There were concerns expressed by some EDBs that the pricing methodology documents could become overly costly and cumbersome if they were required to contain all the information required to enable such a review, particularly quantitative analyses. These are valid concerns. Accordingly, it is felt that the best outcomes could be achieved if the pricing methodology documents contain the main descriptions of the approaches, and *reference* other documents (and spreadsheets where appropriate) published on the EDB's website. However, ultimately it is for the EDBs to decide in which document(s) to publish the various relevant pieces of information.

2)a) Such detailed criteria should be published as far in advance as possible in order that the EDBs have sufficient time to take them into consideration when developing their pricing methodologies.

2)b) Such criteria should not change materially from year to year without good reason.

All EDBs indicated that it is hard for them to undertake processes such as developing pricing methodologies if they are faced with a moving target due to the evaluation criteria, and/or their application, changing from year to year. A stable set of criteria that are signalled well in advance will best enable EDBs to develop durable pricing approaches, and provide the necessary level of detail in their information disclosures.

2)c) Such criteria should be developed with input from the EDBs and other interested stakeholders.

The process of conducting this review has already resulted in a detailed set of criteria for evaluation against the Guidelines being developed. While these have already incorporated some useful feedback from the nine EDBs during the course of the review, canvassing the views of the other 18

EDBs could lead to additional issues being identified which could result in the criteria being further refined[24].

With respect to the evaluation criteria for the assessment against the Principles, section 6.3 has set out some initial suggestions for the type of analysis that could usefully be undertaken. While these are not in a form that could represent detailed criteria, it is suggested that in advance of the Authority developing such detailed criteria for the 2012 review, it could be useful to get industry feedback on such suggestions. (i.e. whether the type of analysis suggested is appropriate; whether some important aspects have been omitted or unimportant ones included; whether more guidance is sought on the specifics of such analysis; and possible suggestions for such specifics).

For both the Guidelines criteria and Principles criteria, the Authority needs to decide whether to seek such stakeholder input via a formal consultation process (and the incur the associated cost and timeframe), or via a less formal process (e.g. using trade associations such as the Electricity Networks Association as a conduit to gather such views).

The level of information disclosure implied by the evaluation criteria suggested in Table 2 and section 6.3 will be relatively detailed. During the course of the review, some EDBs questioned whether the level of detail was justified. In some cases, as already mentioned, feedback from the EDBs has lead to the level of detail required being scaled back. However, in others, analysis undertaken for this review suggests that such a level of detail is appropriate.

In this respect this information disclosure should be considered within the wider context of the Authority using a 'light-handed' regulatory approach to improving distribution pricing consisting of *voluntary* Pricing Principles.

However, this relatively light-handed Principles-based approach can only succeed if:

- the regulator has good quality information with which to assess whether the intent of the Principles is being achieved – hence the Guidelines; and
- the intent of the voluntary approach is acted on by the EDBs.

Otherwise more prescriptive approaches may be the only option available to the regulator which, as was identified in the original Electricity Commission process, risk unintended consequences through not appropriately recognising the differences in network situations which may justify different approaches

Given the complexity of some of the issues associated with distribution pricing, it is judged that the provision of more information (and of a suitable quality) should reduce the risk to EDBs (and New Zealand more generally) of ill-informed regulatory decisions on pricing approaches which, given that the value of electricity distribution assets is approximately $7-$8 billion, should outweigh the costs of providing such information.

That said, it is also understood that progression towards more efficient pricing methodologies is not going to happen overnight. Rather, it is understood that the Authority considers this process as being a 'journey', and that *two-way* exchange of information between the Authority and EDBs, and between EDBs, is an important aspect of helping EDBs progressively move to more efficient pricing approaches that will deliver the greatest benefit for consumers in the long-term.

Thus, this intent for a collaborative, continual improvement processes, has also been in mind when developing the evaluation criteria and recommendations for possible future improvements to this overall process.

[24] That said, there was a strong degree of consistency among the nine EDBs, which suggests that the likelihood of significant additional issues being identified with respect to review against the Guidelines (as distinct to the Principles) is relatively low.

3) Future such reviews should

a) employ face-to-face (or teleconference) dialogue with the EDBs in addition to desk-top evaluations; and

b) publish the detailed evaluations of each of the EDBs

Based on feedback from the EDBs and the reviewers' own experience, the face-to-face and two-way nature of the dialogue for this review was considered to have been considerable of benefit to both parties in helping identify, and get the necessary information on, the key issues.

Further, publishing the detailed evaluations was mentioned by EDBs as delivering positive outcomes in terms of:

- Clearly highlighting examples of best practice; and
- Creating a healthy 'competitive tension' among EDBs in terms of wanting to score well relative to their peers[25].

4) It is suggested that the Authority engage with EDBs to provide some guidance relating to those issues which EDBs perceived as being constraints on their ability to make changes to their pricing methodologies

In this respect, some EDBs suggested that they were constrained in their ability to make changes to their pricing methodologies due to a number of factors:

- Potential legal action from retailers opposed to some pricing methodology changes[26];
- Being constrained on cost allocation approaches because of factors such as rural-urban pricing constraints;
- General constraints on the ability of EDBs to implement changes which could result in significant 'price shocks' to some groups of customers; and
- Some EDBs facing asymmetric risks due to the application of the price control regime[27].

Some EDBs suggested that the presence of such constraints meant that the effort involved in producing information for the pricing methodology reviews would not be justified, as any potential improvements to existing methodologies could not be enacted.

It is considered that such factors do have the potential to be material constraints on some EDBs, although it is out of scope of this report to assess whether they are more perceived than actual.

However, irrespective of whether such constraints are more perceived than actual, it is not considered that providing information about the efficiency of a pricing methodology is a 'wasted' exercise. It is only through the provision of good quality information that political, regulatory, or

[25] Parallels were drawn with similar outcomes for the Commerce Commission's review of EDB's asset management plants.

[26] One EDB cited the instance of a distributor being taken to court by the largest retailer on their network over their proposal to implement GXP pricing in order to deliver (in the distributor's view) more efficient prices.

[27] I.e. any change to a pricing methodology introduces significant uncertainty with regards to how much revenue an EDB will earn relative to target, as there is little experience with regards to how consumers will respond to such changed price signals. There appears to be a perception that regulatory treatment of consequent 'over-charging' would be treated differently to 'under-charging' such that, on balance, an EDB will under-recover relative to target.

even judicial decision makers, who may be in a position to address such constraints, can make appropriate choices.

With respect to such potential barriers themselves, as long as they are perceived to exist it is less likely that EDBs will move to implement changes to their pricing methodologies, even if they may deliver better outcomes for consumers in the long-run.

Accordingly, it is suggested that there would be benefit to the Authority engaging with EDBs and providing some guidance relating to each of the above issues – potentially in conjunction with other government / regulatory bodies (e.g. MED in the case of rural-urban issues, and the Commerce Commission in the case of price control issues).

5) The Authority and Commerce Commission should work to ensure consistency[28] of regulatory disclosure requirements, and potentially consider a single disclosure requirement relating to electricity distribution pricing that would cover both their needs.

In this respect, many EDBs suggested that consistency of regulatory approach was important to prevent any unintended adverse regulatory outcomes, as well as potentially providing opportunities to minimise the amount of unnecessary effort from all parties in terms of disclosing and analysing the various information disclosure items.

To that end, it is understood that the Authority and Commission are already engaged in dialogue on how best to ensure consistent and efficient regulatory outcomes.

[28] Consistency between then electricity and gas sectors, and their different requirements relating to electricity.

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Appendix A. Commerce Commission's current Information Disclosure Requirements relating to electricity prices

(a) Describe the methodology used to calculate prices; and

(b) Include the key components of the revenue required to cover costs and profits of [EDB NAME's] line business activities, including the cost of capital and transmission charges; and

(c) State the consumer groups used to calculate prices, including -

(i) The rationale for the consumer grouping; and

(ii) The method by which [EDB NAME] determines which group consumers are in; and

(iii) For each consumer group, the statistics relating to that group which were used in the methodology; and

(d) Describe the method by which [EDB NAME] allocated the components of revenue required to cover costs of its line business activities amongst consumer groups including

(i) The numerical values of the different components allocated to each consumer group; and

(ii) *The rationale for allocating it in this manner; and*

(iii) *Describe the method by which [EDB NAME] determined the proportion of its charges which are fixed and the proportion which are variable, including the rationale for determining the proportions in this manner.*

Appendix B. Commerce Commission's Pricing Principles, Methodological Requirements, and Template for Pricing Methodology Report relating to Gas Distribution Businesses[29]

SCHEDULE 3 *Clause 7*

PRICING PRINCIPLES AND METHODOLOGICAL REQUIREMENTS

PART 1: PRICING PRINCIPLES

1) Prices are to signal the economic costs of service provision, by:
   a) being subsidy free (equal to or greater than incremental costs, and less than or equal to stand alone costs);
   b) having regard, to the extent practicable, to the level of available service capacity; and
   c) signalling, to the extent practicable, the impact of additional usage on future investment costs.
2) Where prices based on 'efficient' incremental costs would under-recover allowed revenues, the shortfall should be made up by setting prices in a manner that has regard to consumers' demand responsiveness, to the extent practicable.
3) Provided that prices satisfy (1) above, prices should be responsive to the requirements and circumstances of users in order to:
   a) discourage uneconomic bypass, and
   b) allow negotiation to better reflect the economic value of specific services.
4) Development of prices should promote price stability and certainty for customers, and changes to prices should have regard to the impact on customers.

[29] Excerpts from Commerce Commission Authorisations 656 and 657, being the PowerCo (656) and Vector Natural Gas Services Authorisations 2008

PART 2: METHODOLOGICAL REQUIREMENTS

1) Prices are to be consistent with the terms of this authorisation, including any price limits or side constraints that may be set by the Commission.
2) Prices should be based on a well-defined and clearly explained methodology.
3) Price development should incorporate, to the extent practicable, an analysis of the cost of service provision that includes:
   a) definition of the classes of service provided and the parameters by which the quality of service in each class are measured;
   b) an examination of the cost elements that arise from the use, operation and expansion of the network;
   c) identification of the relationship between the quality of service provided and the level of current and future cost for each class of service;
   d) an allocation of existing and future network costs to service classes, and an explanation of the cost allocation methodology used;
   e) the translation of allocated costs into service prices at the defined level of quality of service;
   f) analysis of the extent to which costs are marginal, and whether the associated price components in the tariff structure reflect those marginal costs; and
   g) estimates of the range of subsidy-free prices for each service class.
4) Information relating to standard customers on customer class price levels and structures, quality of service standards, underlying costs, price derivation methods and rationale, and medium term price and quality of service strategies should be publicly disclosed in order to allow current and potential users to understand the basis for prices, and to take account of prices and quality of service standards in their consumption, investment and location decisions.
5) Underlying service classifications, cost data, cost allocations and other elements that contribute to pricing decisions should be periodically reviewed and updated where relevant to reflect industry developments and changes in user requirements and preferences, methods of service provision and costs.

SCHEDULE 4 *Clause 7.3.2*

TEMPLATE FOR THE PRICING METHODOLOGY REPORT

SECTION 1 Overview

- Description of regulatory requirements.
- Description of business' price setting policy framework, including the outcomes sought by the business from its pricing policy.
- Summary of overall pricing strategy for the control period (to 1 July 2012).

SECTION 2 Pricing Methodology

- Description of pricing methodology for controlled services.
- Description of the development of the pricing methodology for controlled services, including, but not limited to:
  - an explanation of how the cost of supply model operates;
  - definition of the classes of service provided and the parameters by which the quality of service in each class are measured;
  - identification of the relationship between the quality of service provided and the level of current and future cost for each class of service;
  - explanation of the cost allocation methodology used to allocate existing and future network costs to service classes;
  - analysis of the extent to which costs are marginal, and whether the associated price components in the tariff structure reflect those marginal costs;
  - description of the methodology to estimate the range of subsidy-free prices for each service class; and
  - demonstration of compliance with the pricing principles.

SECTION 3 Impact of Applying the Proposed Pricing Methodology

- Tariff reform and/or restructuring required, including an explanation for why it is necessary.
- Extent to which rebalancing of prices (if any) between service classes is required, including an explanation for why it is necessary.
- Discussion of the approach to implementing rebalancing over the control period and justification for taking this approach.
- Proposed tariffs for 2009 – 2010 pricing year.
- Comparison of proposed prices per service class for 2009 – 2010 pricing year with prices per service class in 2008 – 2009 pricing year.
- Estimates of subsidy-free prices for all service classes.

- Schedule setting out a reconciliation of how the proposed 2009 – 2010 pricing year's pricing schedule has been derived from the overall revenue requirement through the application of the methodology.

SECTION 4 Medium Term Pricing Strategy

- Expected tariff reform and/or restructuring for the remainder of the control period.
- Expected price movements for each service class in each remaining year of the control period.
- Any further rebalancing that is required to complete the rebalancing between service classes as discussed in Section 3 of this Report.
- Excluded Services:
  - definition of excluded services and charges for 2009 – 2010; and
  - medium term price strategy for excluded services.
- Description of the proposed framework for periodically reviewing underlying service classifications, cost data, cost allocations and other elements that contribute to pricing decisions.
- Discussion of any expected further pricing development in future years of the Authorisation that may lead to changes in the Pricing Methodology Report.

Attachments to be provided with the Pricing Methodology Report – Public Disclosure

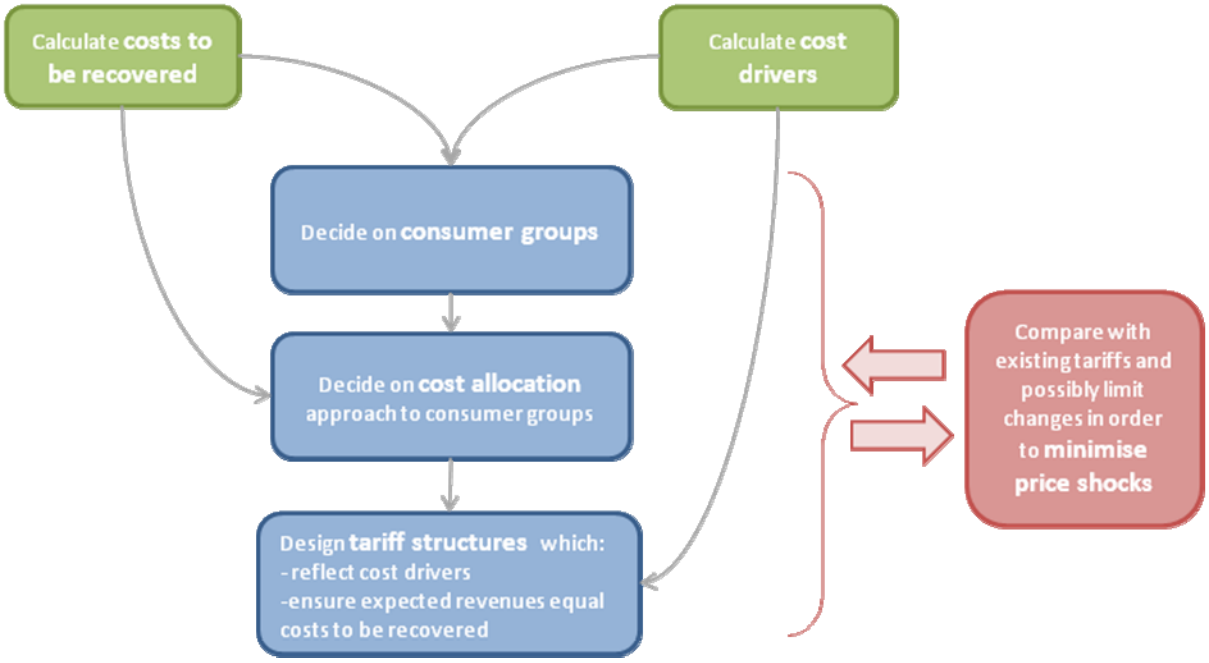
- Director's certificate of compliance of the:
  - pricing methodology with the pricing principles and methodological requirements; and
  - the Pricing Methodology Report with the requirements set out in the Template for Pricing Methodology Report.
- Auditor's report for cost of supply model.

Appendix C. Description of the type of overall methodological approach required

As set out in Table 2 on page 21, Guideline (a) considers the overall pricing methodological approach. This appendix has been developed to explain further the type of expectations around pricing methodology approach that were considered when evaluating the EDBs' methodologies.

While there are necessarily many different aspects to developing distribution tariffs, these can be grouped into a number of main steps. Indeed, many EDBs described their pricing methodologies in terms of such high-level steps. Based on such descriptions provided by EDBs, our interpretation of the main steps required in order to develop distribution prices is shown diagrammatically as follows:

Figure 2: Illustration of key pricing methodology steps



Establishing the costs to be recovered is largely a mechanistic exercise requiring consideration of elements such as:

- Transmission charges;
- Asset depreciation and return on capital invested;
- Operations and maintenance costs; and
- Administration costs.

The Commerce Commission's regulatory regime will have a bearing on this aspect of the exercise.

The principal Guideline which relates to establishing the costs to be recovered is (b)(iii).

Establishing the cost drivers will have a significant bearing on:

- the appropriate consumer groupings (in that consideration will need to be given as to whether particular groups of consumers are sufficiently large, and have characteristics that are such as to have significantly different impacts on the EDB's cost drivers, as to warrant being split into different groups); and

- derivation of the final tariff structure (in that it is important to have tariffs whose structure and level reflect cost drivers in order to send economically efficient price signals)

The principal Guideline which relates to establishing the cost drivers is (b)(iii).

Establishing the consumer groupings can be considered to be the process of deciding how many consumer group 'buckets' an EDB should use, and which consumers should be placed in which 'bucket'. This will be driven by consideration of:

- Which consumers use which assets;
- Which consumers have similar characteristics (and hence similar impacts on underlying cost drivers); and
- The transaction cost implications associated with different approaches (i.e. a 'simple' approach with relatively few consumer groups will have lower transaction costs, compared to a 'complex' approach with large numbers of consumer groups)

The principal Guideline which relates to consumer groupings is (b)(ii).

Allocating costs to consumer groups determines how much of an EDB's overall $m costs should be recovered from each consumer group 'bucket'. This is a largely mechanistic exercise, once the costs have been established, and consumer groups determined

The principal Guideline which relates to cost allocation is (b)(iv).

Development of the tariff structures determines how a given $m cost for a particular consumer group 'bucket' should be recovered in terms of the mix of fixed and variable charges, and what metrics and levels should be used for such variable charges[30]. This requires consideration of the underlying cost drivers and the costs to be recovered in order to set tariffs which not only recover the required costs, but in doing so send economically efficient price signals to consumers.

The principal Guidelines which relate to the development of the tariff structures is (b)(v) and (b)(vi).

Comparing the resultant tariffs with existing tariffs is necessary to inform considerations of the extent to which any tariff changes will result in 'price shocks' to consumers. Given that different tariff structure approaches can result in significantly different levels of cost recovery from different consumer groups, this is an important factor to consider when contemplating whether/how to implement tariff changes to achieve other goals (e.g. improved economic efficiency).

The principal Guideline which relates to comparing new with existing tariffs is (c)(ii).

The Guidelines which relate to how all these various steps fit together and the nature and level of detail of supporting evidence provided in the pricing methodology documents are (a) and (c)(i)

In order to be compliant with the Guidelines, it will be necessary to present sufficient information to describe the issues and rationale for the approach taken for each of these main steps.

[30] E.g. should the variable component be recovered on a $/kWh basis, and if so should different rates be used for different times; or should it be based on some measure of capacity ($/kW or $/kVA), and if so what should be the basis of such capacity measurement (e.g. a customer's connection capacity, their individual measured peak demand, or their contribution to overall network peak demand)?

Appendix D. Detail of individual EDB assessments

EDB	Score	Comment
(a) Prices should be based on a well-defined, clearly explained and published methodology, with any material revisions to the methodology notified and clearly marked.		
Methodology is well-defined		
Company E	2.5	Methodology is based on a clear objective, directly related to cost drivers, with the most significant aspect of the methodology discussed in depth. Other aspects could be built on in some areas. Benefits are discussed. Key assumptions of formula derivation are included, and some brief quantitative analysis to support use of peak pricing (significant info and analysis on formula derivation)
Company D	2.5	The methodology includes and follows a clear objective. The steps are presented in a logical fashion. Key considerations in determining the methodology are outlined. There is discussion of cost drivers and their implications for determining consumer groups and tariff structures. More analysis could be provided or referenced to support the method used.
Company H	2	Pricing Methodology follows a clear set of objectives. Processes are stepped through relatively logically. Background information is provided that highlights cost drivers, which are used to determine consumer groups, less so cost allocations/tariff structures. There is no analysis provided or referenced to support the method used. Alternatives to some individual aspects are discussed in some places, though these have not necessarily been enacted (where benefits are stated) or compared to existing practice.
Company G	2	The high-level steps are presented in a logical fashion. There is some discussion of cost drivers and how these influence consumer groups and tariff structures. There is discussion of an alternative method for allocating costs but this is not compared to the status quo.
Company A	1.5	The high-level steps are presented in a relatively logical fashion. There is some discussion around the key cost drivers and their implications for determining consumer groups and tariff structures. Brief discussion of GXP/ICP billing, but minimal discussion of the suitability of either approach for the network,

		given its characteristics/situation. Includes a corporate vision, and pricing strategy, mostly discussing past and future outlook. Brief discussion of key forces/considerations.
Company F	1	The high-level steps are presented in a relatively logical fashion. Little discussion around key cost drivers and their implications for determining consumer groups and tariff structures. Generally, no analysis provided or referenced to support the method used. Some basic assumptions are stated when explaining certain aspects, but this is not comprehensive.
Company I	1	A clear objective is stated. The high-level processes are stepped through relatively logically. There is some basic rationale given in some areas, but this does not link back to the cost drivers and their implications for consumer groups and tariff structures. Generally no analysis provided or referenced to support the method used.
Company B	1	The high-level steps are presented in a logical fashion. There is no real discussion of why the approach used was employed or the objectives sought. There is some basic rationale given in some areas, but this does not link back to the cost drivers and their implications for consumer groups and tariff structures. There is no discussion of the suitability of the methodology for the network, given its characteristics/situation.
Company C	0.5	The methodology does not follow a clear objective. There is little discussion or identification of key cost-drivers and how these impact on the pricing structure. Rationales could be further developed in most areas. There is no analysis provided or referenced to support the method used. The steps required to produce final prices are under-developed in some areas, and not set out in a particularly logical manner.
Methodology is clearly explained		
Company D	2.5	A comprehensive and well-rounded document. The report is stepped through logically, and is well structured for comprehension. Good inclusion of background and introductory information.

		The report clearly outlines what has been done, as well as providing explanations for why in most areas.
Company H	2	The majority of the methodology is easy to follow, and progresses in a fairly logical manner. Structure could be improved and re-ordered in some areas, but there is a good use of diagrams and tables. Background information helps to understand aspects of methodology
Company F	2	The report is stepped through logically - progression matches method - though it is brief in some areas and could be fleshed out. Generally the report describes what has been done relatively well, but provides little substantiating evidence for why a particular approach has been adopted.
Company G	2	Document reads very clearly in most areas and is stepped through logically - progression matches method. Useful background information provided into nature of the network. Some explanations developing for why the specific approach has been used.
Company B	2	Clarity could be improved through better structuring of the document and more discussion in general. The tables are useful and things are relatively well explained but could benefit from more detail and structure. The report describes what has been done relatively well, but the reasons for why the particular approach has been used are not as comprehensive.
Company E	1.5	Structure is a bit confusing. Some aspects seem under-developed or missing, or need clarification. Technical discussion re formula handled well. Some useful background info. Supporting information contained in appendices but difficult to interpret - not referenced from the document or otherwise explained, poor headings, no units etc.
Company I	1.5	The methodology is stepped through in a relatively logical manner, and some individual aspects are explained well. Tables placed within the bulk of the report tend to break the flow of the document. The report explains what approach has been used relatively well, and discusses the benefits of some aspects, but provides little explanation and substantiating evidence for why a particular approach is used.
Company A	1.5	Parts of the document are well structured, some parts are a bit more scattered. Report is quite brief - more so as it progresses

		- and could be fleshed out. Relatively good discussion around GXP/ICP billing and have appropriately dealt with issue of communicating two different methodologies for two different regions
Company C	0.5	The methodology is very brief. The steps taken to allocate costs are not logically progressed, and there is no background information provided. Generally, the document appears to describe the pricing structure, but not necessarily how it has been derived, or why.
Methodology is published		
Company E	3	Pricing Methodology available on TLC website for 2004 - 2010. There is also a simplified explanation of line charges, and a recent report of a pricing review. Additional info also supplied directly to customer (i.e. is not online).
Company F	2.5	Pricing Methodology disclosure is available on the Company F website, going back until at least 2005. There is an additional resource that acts as a supplement to the pricing schedules - the "Pricing Policy" – explaining the details such as group categories and tariff breakdown, and includes a section called “Current and future tariff direction”. That section indicates that there have been some minor changes to load group, and they are consulting on ways to avoid incentives for customers to temporarily disconnect from the network (assumed to be for holiday homes). Also has a pricing consultation document.
Company D	2.5	Pricing Methodology for 2011 only is published on the Company D website. There is also a document outlining changes since 2010, and a customer-oriented booklet explaining pricing in simple terms.
Company B	2.5	Pricing Methodology disclosure for past 2 years published on website. Also a pricing consultation paper which discusses possible changes in 2011.
Company C	2	Pricing Methodology is available on the Company C website going back to 2004.
Company H	2	Pricing Methodology for 2011 available on Company H website.
Company I	2	8 years of Pricing Methodology available on Company I website. xxx only available for 2000. No additional consumer-oriented information available
Company A	2	Pricing Methodology for the last three years is on the Company A website.
Company G	2	Pricing Methodology for 2011 only found on Company G website. There are additional documents relating to loss factors and

		exemptions from regulations, but no customer oriented information.
Revisions are notified and clearly marked		
Company I	2.5	No changes made in 2011, which is clearly stated at the very start of the report.
Company D	2.5	There are no methodology changes as identified clearly in a separate document, which also outlines price changes.
Company B	2.5	Revisions are pointed out during discussion in the document - some in dedicated sections – these could be summarised at the beginning for clarity. The reasons for the changes are well discussed during the document.
Company C	2	It is stated that there have been no changes to the methodology in 2011.
Company H	2	A number of changes have occurred and been discussed throughout. These changes are briefly noted, though not outlined, in the introductory sections.
Company A	2	States that existing methodology remains in place. Some price changes are identified near the beginning of the report, including CPI price adjustments and closing tariff options.
Company F	1	States it has "redeveloped its cost allocation model over the past two years" - it's somewhat unclear whether this has had any effect in 2011 itself, but there are not any specific changes discussed. This could be clarified at the start of the report or otherwise discussed. There is a revision table briefly outlining changes annually since 2008, though the changes seem more targeted to the report than the methodology itself - probably more for internal uses?
Company E	1	Perhaps some minor changes in pricing formula inputs, but no other changes in 2010. The existence or otherwise of changes is not explicitly stated.
Company G	1	States that prices have been reviewed in 2011, though it is not clear that there have been no methodology changes as part of that.
(b) The pricing methodology disclosed should demonstrate: **(i) How the methodology links to the pricing principles and any non-compliance**		
Links to Principles outlined		
Company A	1.5	Section 8 near the end details areas of alignment with the pricing principles. Section 9 includes a table to summarise/direct to relevant areas of the document.

		There are some graphs that visually demonstrate alignment with the Pricing Principles, and give some indication of the extent of alignment.
Company C	1	Section 8 at the end of the document is dedicated to outlining areas of alignment with the Pricing Principles. Principles are stated with an associated discussion below. There is no quantitative analysis presented, or links to such analysis given, to demonstrate how the methodology meets the Pricing Principles. There are gaps between the information presented here and in the rest of the methodology.
Company H	1	Areas where the methodology (particularly new changes) has specifically aligned with the PP are discussed in the body of the report. Section 6 at the end of the report also specifically outlines areas of alignment with the PP. There is no quantitative analysis given or demonstrated in any of that discussion - no indication of the extent of compliance.
Company F	1	There is discussion in section 15 on how each Pricing Principle is satisfied by Company F's methodology. Principles are stated, grouped in some cases, and have an associated discussion below. Links to the principles are not discussed within the description of the methodology. Some brief analysis to demonstrate alignment with PP 1a is given, though there is no further analysis that would help demonstrate how aspects of the methodology support the objective of the Pricing Principles.
Company I	1	Section 8 at the end of the document outlines areas of alignment with the pricing principles. Principles are stated with an associated discussion below. There is no quantitative analysis presented, or links to such analysis given, to demonstrate how the methodology meets the Pricing Principles.
Company D	1	Appendix B outlines how/where Company D's pricing methodology aligns with the principles. The relationship between the statements and the principles is not explicit in some instances. There is no quantitative analysis presented, or links to such analysis given, to demonstrate how the methodology meets the Pricing Principles or their over-arching objective.
Company G	1	Section 5 at the end of the document outlines areas of alignment with the pricing principles. Principles are stated with an associated discussion below. There is no quantitative analysis presented, or links to such analysis given, to demonstrate how the methodology meets the

		Pricing Principles and their over-arching objective.
Company B	1	Section 6 is dedicated to outlining how/where Company B's pricing methodology aligns with the principles. The principles are addressed under sub-headings, without being specifically quoted or referenced. There is no quantitative analysis presented, or links to such analysis given, to demonstrate how the methodology meets the Pricing Principles and their over-arching objective.
Company E	0.5	Links to the pricing principles identified in separate document. These are brief and do not demonstrate how compliance is achieved for some Principles.
Non-compliance identified		
Company G	2.5	There are no areas of non-compliance identified, but areas of weaknesses and a number of possible areas subject to future work are identified.
Company H	2	There are no areas of non-compliance identified. Some areas of future work are signalled, both in terms of being able to demonstrate alignment better, and actually enhancing alignment.
Company F	2	There is acknowledgement of a weakness (for PP (e)) in terms of the simplicity for retailers, with a suggestion that this may be re-addressed in future. Could provide analysis of the trade-offs between Company F's and retailers' competing objectives. Also states there will be a full review of tariff structures in 2011 with some areas of interest stated.
Company E	1.5	The methodology is said to comply with all Principles, there is very brief mention of improvements that could be made to aid compliance.
Company A	1.5	The methodology is stated to be fully compliant, though there is suggestion that achievement of the objective of the Principles could be improved as a review of prices is planned for 2011, aiming to closer align prices in the two regions.
Company C	1	The methodology is said to comply with all Principles, though there is no mention of whether future changes could be made to further achieve the objective of the Principles.
Company I	1	The methodology is said to comply with all Principles, though there is no mention of whether future changes could be made to further achieve the objective of the Principles.
Company D	1	The methodology is said to comply with all Principles, though there is no mention of whether future changes could be made to further achieve the objective of the Principles.
Company B	1	The methodology is said to comply with all Principles, though there is no mention of whether future changes could be made

		to further achieve the objective of the Principles.
(ii) The rationale for consumer groupings and the method for determining the allocation of consumers to the consumer groups;		
Consumer groups are outlined		
Company D	3	Section 4 of the methodology outlines the connection categories. It states commonalities within a group and things differentiating a group from others. Each group is discussed under a separate sub-heading with a similar structure. The metrics and statistics for each are given.
Company H	2.5	Consumer groups are outlined in Section 3.2.2, with defining features specified. Statistics for each group are provided. Groups and tariffs outlined in a table.
Company F	2.5	Section 7 explains the consumer group categories used. The breakdown of the groups into sub-groups is shown in a tree diagram and table which is useful. Statistics are set out in the next section. The further breakdown of the groups into different tariff options is described although this may benefit more from being discussed in the section about the tariff structures.
Company G	2.5	Section (4.2) discusses how the consumer groups are split up and the characteristics of the consumers in each. There is a table showing the groups and the number of ICPs in each, and a later table includes metrics for each group
Company B	2.5	Section 3 gives detail on the disaggregation of customer groups. There is a good table to summarise the breakdown. Key metrics are also included. There are some changes to the load groups in 2011 that are introduced and explained.
Company C	2	Consumer groups are outlined in a table structure. Statistics are provided in an appendix.
Company E	2	The consumer groups are discussed. This would benefit from being demonstrated visually. Some metrics are provided in the appendices.
Company I	1.5	The consumer groupings are discussed in Section 4, including the method for determining them, though this is brief. Metrics for each group are outlined well in tables. Discussion/outline of sub-groups is under-developed.

Company A	1.5	The groups used are stated, with metrics outlined in a table, though not all metrics that are used in the allocation of costs.
Rationale for groupings provided		
Company D	2.5	A rationale is provided for each group in terms of shared assets or similar usage patterns, and has been related to cost drivers.
Company H	2	A rationale is provided for each group in terms of network characteristics, which have been related to cost drivers. Benefits of the groupings are discussed.
Company G	2	The rationale behind the split is discussed, with some reference to cost drivers and common characteristics - e.g. consumption patterns and controllable load for residential split, capacity split for commercial to reflect costs required. There is no analysis provided or referenced to support the groupings.
Company I	1.5	Some rationale and supporting evidence provided for the consumer groupings chosen, with references to key characteristics of different customers. Information is fragmented and could be summarised
Company B	1.5	Some rationale is given for the breakdown with reference to load profiles. This is not comprehensive and does not link to cost drivers.
Company C	1	Rationale is stated as being historical for stability. There is no discussion of the limitations necessitating this. There is no reference to cost-drivers and the characteristics of the groups are not discussed.
Company E	1	Some indication of rationale in terms of shared use of assets. Limited evidence presented.
Company A	1	Some rationale included with reference to trade-offs, though no supporting evidence provided for the consumer groupings chosen, and discussion does not link to cost drivers.
Company F	0.5	There is discussion of why costs are allocated at the consumer group level as opposed to the price category level, although this was found to be a little confusing. Limited rationale and supporting evidence presented for the actual consumer groups chosen (at either the cost allocation or price category level), particularly with reference to the key characteristics of different consumers and their impact on cost drivers.
(iii) Quantification of key components of costs and revenues;		

Key components of costs included		
Company D	2.5	A breakdown of costs is provided in section 5. Costs are broken down into detailed and comprehensible line items, and transmission/distribution separated. Peak demand identified as prominent driver of costs and is quantified. The basis for the targeted return on capital is briefly mentioned.
Company H	2	Costs are detailed by region, at a good representative level of breakdown. Cost breakdown is not directly related to allocation method which reduces clarity somewhat. Key drivers behind costs are discussed though not quantified.
Company E	2	Costs provided in an appendix. Breakdown is detailed but cost items are not well defined. Key drivers behind some costs are discussed at various points of the document but not quantified.
Company G	2	Cost components are outlined in section 4.1, using a good representative breakdown. Discusses how the return on assets is determined, including consideration of changes that could be made to this in the future. Drivers of costs are briefly included with the allocation method but are not quantified and could be elaborated on.
Company I	1.5	The key costs items are outlined in Section 3.2, then the actual figures stated later during derivation of the tariffs. The figures are not summarised. The costs are broken down into clear categories. Drivers of the costs are not discussed
Company A	1.5	The key costs are identified for East and West distinctly in Section 5. The breakdown is not particularly detailed or informative. There is a brief explanation for what each cost item includes, but no discussion for the drivers of each cost.
Company B	1.5	Costs are stated with brief mention of the determination of a couple of cost items, but no discussion of the drivers of the costs. The cost breakdown is detailed and comprehensive. This level of detail is not continued for cost allocation or revenue info.
Company C	1	Revenue requirements are stated. Breakdown is not very detailed and only one part of one of the line item is discussed in any detail. There is no discussion of cost drivers

Company F	1	Table 3 sets out breakdown of costs, although there is limited description of what each line item covers. No discussion of the key drivers of such costs.
key components of revenues included		
Company H	2.5	Allocation of costs across the consumer groups is shown, at the same level of breakdown as costs. Useful analysis re actual vs. target revenues provided.
Company C	2	The revenue is shown across the consumer groups, split into transmission and distribution, in the appendix. This is not the same breakdown as given for the required revenue.
Company F	2	The revenue generated across the consumer groups is shown. Mentions expected vs. required revenues. This could be elaborated on in terms of how the difference is reflected across consumer groups.
Company I	2	The revenues across consumer groups are outlined, at the same breakdown as costs, and detailed in tables for each tariff group.
Company A	2	Revenues are outlined for each cost component and consumer group.
Company D	2	Revenues are outlined for each corresponding cost line-item and each consumer group.
Company G	2	The revenue generated across the consumer groups is shown at same breakdown as costs. Also shows the budgeted revenue from each group, with brief discussion of the difference between the two.
Company B	2	The revenue across the consumer groups is shown in tables, split into transmission/distribution.
Company E	1.5	These appear to be in the appendices but are difficult to identify. Are not given at the same level of breakdown as costs.
(iv) An explanation of the cost allocation methodology and the rationale for the allocation to each consumer grouping;		
Cost allocation methodology explained		
Company H	2.5	Generally good approach to explaining what method is used. Qualitative description is well supported by the use of figures and tables.
Company F	2.5	Generally good approach to explaining what approach is used. Qualitative description is well supported by the use of figures and tables.

Company D	2.5	Good approach to outlining the allocation of costs. Stepping through each cost-item under a separate subheading with qualitative description and table.
Company I	2	The metrics used are outlined. Diversity factors discussed. Allocation process for each cost item is clearly stepped through.
Company G	2	The cost allocation is discussed in Section 4.3. The allocation is slightly confusing, in that it sounds as though the methodology presented isn't actually what has been used to determine the tariffs. This could use some clarification.
Company C	1.5	The method for allocating costs is brief, and some aspects are unclear.
Company E	1.5	Regional cost allocation described including metrics used for each item. Allocation into sub-groups not so clear.
Company A	1.5	Metrics used are outlined, and the approach used for each cost item briefly stated.
Company B	1.5	There is discussion of the allocation methodology in Section 4. The different allocators used are stated and information about those allocators given. Information about the distribution of assets is given. It is not clear for all costs which allocation metric is used.
Rationale provided		
Company H	2	Useful breakdown of assets between groups, and explanations for the metrics used to allocate. Discussion of peak demand as a cost driver, but restricted influence on allocation methodology.
Company F	2	The reasons for the metrics used are given in the bullets in section 6. Explanations used relate to cost drivers but are rather brief.
Company D	2	The rationale behind the process is given. Useful breakdown of assets between groups, and explanation for the metrics used to allocate. Sets out assumptions for VoLL for the different customer groups.
Company I	1.5	There is little rationale for the split between metrics used for each cost item, although a general objective of the allocation method and metrics used is evident, with regard to cost drivers.
Company G	1.5	Reasons for the metrics used are given. Explanations used relate to cost drivers but are rather brief.
Company B	1.5	There is some discussion of why each allocator has been used, though links between metrics used and cost item are not clear in some cases.
Company E	1	Rationale for the metrics used is not provided.

		There is some discussion about what cost items certain charges are recovering although this is not well summarised.
Company C	0.5	Rationale is stated as being historical, though there is no discussion of the appropriateness of this approach.
Company A	0.5	There is little rationale provided for the metrics used.
(v) An explanation of the derivation of tariffs to be charged to each consumer group and the rationale for the tariff design;		
Tariff derivation is explained		
Company D	2.5	Section 7 outlines the tariff structure. This is then broken down for each consumer category into fixed/volume/peak and transmission/distribution. The actual charges are shown.
Company H	2	Fixed/variable split is outlined and discussed. Derivation of tariffs is stated as historical. There is a significant discussion on TOU tariffs, rationalisation etc.
Company B	2	Discussion on the tariff structure is provided in Section 5. There is discussion of the use of fixed/variable and peak charges. The split between fixed and variable revenue for each group is shown in a table.
Company C	1.5	The derivation of tariffs is described, though some aspects are unclear. The actual split is not shown. Discussion on this in Section 8 could be included in body of the methodology - e.g. Fixed charges increasing with capacity, controlled/uncontrolled tariffs etc.
Company F	1.5	Section 9 discusses the breakdown of tariffs into fixed and variable charges. It outlines the considerations made when setting this split (low user fixed charge regulations), but does not go into any detail about what the exact split is. There is no description of controlled tariffs.
Company E	1.5	Outlines the different charges. Magnitude of each component is unclear. Demand charge discussed in detail, with demonstration of the analysis performed to determine magnitude.
Company G	1.5	Section 4.4 and 4.5 discuss the breakdown of tariffs into fixed, variable and demand charges. Mentions controlled tariffs. It does not go into any detail about what the exact split is. A visual demonstration of the tariff options could aid clarity.
Company I	1	The split of tariffs between fixed/variable charges is stated, though the derivation of that split is not discussed. Derivation of tariffs for peak/off-peak, controlled and night charges not outlined.

Company A	1	The different elements of the tariff structure are not well explained, and the actual split is not discussed for all tariffs. The existence of controlled and night tariffs is stated, but no details about those tariffs are given.
Rationale provided		
Company E	2.5	Mix of components set to match cost drivers. Rationale for peak charge identified, with supporting evidence demonstrated and benefits discussed. Other components not considered in as much depth.
Company D	2.5	There is a discussion as to why LRAIC is used to allocate costs, relating to peak demand driving costs. Relatively good explanations for the fixed/variable/peak charges, but no analysis given into the extent to which economic outcomes are achieved.
Company I	1.5	The benefits of a variable component to the tariff are outlined well. However there is no analysis or supporting evidence to suggest that the actual split used will achieve optimal outcomes, or is sending desirable price signals.
Company G	1.5	Some explanation for the tariff structure, including considerations made. There is some discussion linking the structure to cost drivers and price signals, though no analysis to support the latter.
Company B	1.5	There is a list of the considerations made - though it is not clear how these considerations have impacted on the tariff structure. There is brief explanation for the particular tariff structure chosen, though this is not explicitly linked to cost drivers. There is no evidence provided for how the structure will achieve desired outcomes.
Company C	1	Rationale is stated as being largely historical. No demonstration of how the tariff structure links to cost-drivers or achieves economic outcomes.
Company H	1	Rationale stated as being largely historical. Does not explain why it is appropriate to maintain this given they note rationale for an alternative approach. No links to cost drivers. No demonstration of how the resulting tariffs are likely to deliver economic outcomes.
Company F	1	Little explanation, and no evidence, provided for why the particular tariff structure was chosen in terms of achieving optimal outcomes. No demonstration of how the tariff structure links to cost-drivers, and whether / how the resulting price signals are likely to

		deliver economically efficient outcomes.
Company A	1	Little explanation and no evidence provided for why the particular tariff structure was chosen, in terms of achieving desired outcomes. There is no demonstration of how the tariff structure links to cost-drivers, and whether/how the resulting price signals are likely to deliver economically efficient outcomes. There is brief discussion of the benefits/limits of GXP and ICP billing.
(vi) Pricing arrangements that will be used to share the value of any deferral of investment in distribution and transmission assets, with the investors in alternatives such as distributed generation or load management, where alternatives are practicable and where network economics warrant.		
Pricing arrangements outlined		
Company H	2	States in the final section that the methodology regarding allocation for alternatives has been drafted and is awaiting approval. There is discussion of new tariffs that seek to send signals to help defer investment, including demonstration of the price differences.
Company E	2	The document covers the use of price signals to defer investment well. Could also provide analysis of the magnitude of asset deferral or success of signals provided to encourage demand response.
Company D	2	Good discussion of export credits and payments to generators, and providing peak signals to discourage consumption. Could also provide analysis of the magnitude of asset deferral, or success of signals provided to encourage demand response.
Company C	1.5	Pass-through of benefits for embedded generators outlined briefly, with basic reference to the previously described methodology. There is discussion of controlled tariffs in Section 8. This could be developed in the body of the methodology. There is no discussion of the signals provided by controlled tariffs or how those were derived. Could also provide analysis of the magnitude of asset deferral or success of signals provided to encourage demand response.
Company F	1.5	Some discussion on controlled tariffs, though no discussion of the differing signals provided or how those were derived. There is also discussion on charges relating to the deferral of investment in the back section. This could be developed within

		the body of the methodology. Could also provide analysis of the magnitude of asset deferral or success of signals provided to encourage demand response.
Company I	1.5	Brief discussion of peak/off peak tariffs for demand response included in back section. This could be developed within the body of the methodology. No discussion of the actual signals sent or how they were derived. Could also provide analysis of the magnitude of asset deferral or success of signals provided to encourage demand response.
Company A	1.5	Brief discussion provided on the existence of tariffs and credits to encourage deferral of investment. There is no discussion of the differing signals provided by controlled/night tariffs or how those were derived. Could also provide analysis of the magnitude of asset deferral or success of signals provided to encourage demand response.
Company G	1.5	Controlled tariffs are discussed in tariff section, featuring reduced and multiple tariff options to encourage uptake, though no information on the different price signals or how these levels were set. Could also provide analysis of the magnitude of asset deferral or success of signals provided to encourage demand response.
Company B	1.5	Brief discussion of payments to embedded generators in back section. This could be developed within the body of the methodology. Could discuss why it believes signals to encourage demand response aren't particularly necessary for Company B.
(c) The pricing methodology should: **(i) Employ industry standard terminology, where possible; and**		
Industry standard terminology used		
Company F	3	Industry standard terminology seems to have been followed. A glossary is included.
Company H	2.5	Industry terminology appears to have been used through-out. Acronyms have been defined and metrics well defined.
Company A	2.5	Industry standard terminology appears to have been used through-out. Acronyms and metrics are defined.
Company D	2.5	Industry standard terminology seems to be used throughout.

		Metrics and acronyms are explained well.
Company B	2.5	Industry terminology seems to be used through-out. Metrics and acronyms are explained in the text.
Company C	2	Industry standard terminology appears to have been used through-out. No definition of some acronyms and terms.
Company E	2	Industry terminology appears to have been used through-out. Acronyms have been defined but metrics have not.
Company I	2	Industry standard terminology seems to be used throughout. Acronyms are defined but some terms are not.
Company G	2	Industry standard terminology appears to have been used through-out. Acronyms are defined, but some terms could have been further explained.
(ii) Where a change to the previous pricing methodology is implemented, describe the impact on consumer classes and the transition arrangements implemented to introduce the new methodology.		
Impact described		
Company B	2	An impact assessment on the tariff structure change is included, including before and after tariffs. Reasons for changes discussed well
Company H	1.5	A specific impact assessment has not been performed on the changes, however where changes are discussed, their effects on prices are briefly mentioned - e.g. "the general effect will be for small increases or decreases depending on which price option the end user is on".
Transition arrangements discussed		
Company H	1.5	Transitional arrangements are discussed for these changes too - i.e. "opt in". They have stated a policy of restricting changes to 10% and that phased transitional arrangements are in place.
Company B	1.5	Transitional arrangements are discussed, though it is not clear how these will impact future years' pricing.

Appendix E. EDB statements on the importance of peak demand as a cost-driver

EDB	Statements on cost drivers
Horizon	*"The underlying drivers for electricity supply services, [are] the provision and maintenance of adequate capacity."* (Horizon, April 2011) page 12. *"It is difficult to estimate the incremental cost of supplying each consumer each additional unit of capacity. However it is reasonable to assume that the incremental cost of connecting each additional general consumer to the network is small.* *... In terms of signalling the impact of future usage on future investment costs, the most relevant price for this purpose is a demand charge."* Ibid page 20
Marlborough Lines	*"In our view the most effective pricing structure to signal the impact of demand on investment is where the price is related to the end users demand during the peak demand period on the network"*. (Marlborough Lines, April 2011) page 22
Orion	*"The most significant cost driver that influences our delivery service is the combined peak demand of all consumers (ADMD). We design and construct our network to meet this combined peak load. We consider that approximately 50% of our distribution costs*[31] *are directly dependent on peak loading (the remainder of our costs are either fixed or dependent on the peak demand of individual consumers or groups of consumers)."* (Orion, April 2011) page 18.
Powerco	*"The most significant cost driver that influences investment requirements in the network is the combined peak demand of all consumers in the area."* (Powerco, April 2011) page 24
PowerNet	*"The most significant cost driver that influences investment requirements in the network is the combined peak demand of all consumers in an area"* (PowerNet, April 2011) page 46
The Lines Company	*"It is the long and short term (demand) capacity requirements of its connected customers, rather than the amount of electricity conveyed that determines the investment the company has to make in its network."* (The Lines Company, April 2010) page 1 *"Growth at the peak times will eventually cause the existing capacity of the line to be exceeded, requiring us to invest in new assets to supply extra capacity."* Ibid page 2
Unison	*"... it is peak demand (not total volumes consumed) that drives Unison's long-term cost structure*" (Unison, April 2010) page 10.
Vector	*"There are a myriad of factors that contribute to the overall level of network costs including but not limited to distance, end consumer density, end consumer demand profiles, traffic management conditions, age of the network, and incidence of other utilities in the road (which can cause additional costs of relocating assets)."* (Vector, April 2011) Page 12.

[31] It should be noted that in this context, "distribution" doesn't include the transmission charges incurred by Orion – which in Orion's case are 82% driven by peak demand. Using the information provided by Orion in its Pricing Methodology document on transmission and distribution costs, an overall estimate of the extent to which Orion's total costs are driven by peak loading has been estimated to be 59%.

	"Vector has identified the most significant driver of network costs as end consumer peak demand". Ibid page 26 *"The extent of capacity usage is measured by the network peak-demand over the capacity for a particular network segment. The best pricing structure to signal capacity usage and potential future investment is through a price related to the end consumer's demand during the peak-demand period on the network (where network demand is the highest)."* Ibid Page 38
Westpower	*"Ideally, the variable component signals the incremental cost to provide capacity when the distribution network is operating at peak loading. The rationale for this component is that the investment in networks is primarily determined by the maximum loading on the network."* (Westpower, April 2011) page 6

Appendix F. Analysis of the extent to which EDBs appear to have considered the Pricing Principles

The analysis presented within this appendix is relatively simple and high-level, and uses a number of gross simplifying assumptions in many cases. Accordingly it should not be considered a rigorous assessment of EDBs' application of the Principles.

Rather, its purpose is to *inform* consideration of:

- which aspects of EDBs' pricing methodologies are likely to be most important in determining outcomes which are consistent with the Principles; and thus
- which aspects are likely to merit relatively detailed information disclosure and subsequent analysis by the Authority for its 2012 review.

The Appendix starts with consideration of the different observed approaches to customer grouping and cost allocation, before considering the different observed approaches to the design of tariff structures.

Analysis of the variation in approach to customer grouping and cost allocation

General variation in approaches to customer grouping and cost allocation

There was considerable variation in approaches to customer grouping and cost allocation.

A number of the EDBs suggested that there was no unambiguously 'right' way to allocate costs among customers.

Further, they suggested that while moving from one approach to another could result in significant wealth transfers from one group of customers to another, they suggested that it would be less likely to result in material differences in economic efficiency, and thus most such approaches would be consistent with the Principles. Based on this position, they suggested there would be relatively little benefit in requiring extensive information disclosure on customer grouping and cost allocation approaches.

In other words, they appeared to be suggesting that while there could be significant 'winners' and 'losers' between customers due to different approaches, such different approaches:

- Would not *overall* result in materially different quantities of electricity consumed across all consumers (and thus costs in terms of supply of such overall quantities). I.e. productive efficiency would not be materially affected; and
- Would not result in material *net* allocative inefficiencies across all customers in terms of:
  - useful consumption being unnecessarily curtailed (in the case of the 'losers');or
  - excess consumption occurring for the 'winners', the value of which is lower than the cost of supply.

In order for this to be true, either or both of the following conditions would need to be satisfied:

1. Demand would need to be very inelastic. i.e. even if prices changed significantly, consumers would not significantly alter how much they consumed.
2. Electricity supply costs would need to be largely fixed (i.e. independent of demand), and thus prices to consumers would thus be largely fixed rather than variable.

With respect to the price elasticity of electricity demand, it is considered that it *is* relatively inelastic in the short term. However, in the medium to long term (i.e. over a year or more) it is considered

that electricity demand is more elastic. Indeed, recent Electricity Commission / Authority cost-benefit analyses have used a figure of -0.26[32].

With respect to the mix of fixed versus variable costs, it is considered that in the short-term costs can be largely fixed. However, in the long-term (i.e. over a 15-20 year time frame) it is considered that a significant proportion of an EDB's costs are variable, driven in particular by peak demand. Thus, if peak demand were to grow, an EDB's costs would also grow in the long term.

Both of the above points appear to suggest that there could be material economic efficiency implications from different customer grouping and cost allocation approaches when measured over the medium to long-term.

However, mitigating this potential risk of inefficient outcomes is the fact that, despite a significant proportion of an EDB's costs being variable in the long-term, a material amount of an EDBs' costs *are* fixed on a *per customer* basis[33]. Thus, if the different customer grouping & cost allocation approaches were 'only' to result in differences in the fixed costs that different customers faced, but didn't impact on the level of their variable charges[34], there would be limited altered consumption decisions and thus limited productive and allocative efficiency impacts (although there would be wealth transfers between the customers).

However, if the level of cost allocation were such as to make it not possible that a customer's variable charges appropriately reflected the level of the underlying cost drivers there would be productive and allocative inefficiencies that would emerge.

No detailed quantitative analysis has been done on this matter, but given that a material amount of EDBs' costs are fixed, there is the potential for the different approaches not to yield material economic efficiency impacts, *provided that they don't affect an EDB's ability to set tariff structures whose price signals for the variable component of such charges are closely matched with the values for the EDB's underlying cost drivers.*

That said, some EDBs have noted that there are considerable degrees of cross-subsidy between different groups of customers (particularly with respect to 'rural-urban' factors), often driven by historic (and sometimes political) decisions. While from a first principles basis it could be considered that significant cross-subsidies are undesirable and should be avoided in terms of future decisions, whether or not existing cross-subsidies should be 'unwound' raises difficult public policy issues.

Further, it has been variously noted by both EDBs and retailers that approaches which result in large numbers of consumer groups imposes transaction costs for both EDBs and retailers, which are a genuine economic cost. It is understood that many EDBs' moves over recent years to simplify their pricing methodologies, particularly in terms of customer groupings, is in large part driven by the desire to deliver such operating efficiencies. Such transaction cost savings should be taken into account in any evaluation of the economic efficiency of different customer grouping approaches.

In summary, for the 2012 review it is suggested that EDBs should be required to demonstrate that their chosen consumer grouping & cost allocation approaches:

- do result in prices being 'subsidy free' – i.e. 'equal to or greater than incremental costs, and less than or equal to standalone costs'; and

[32] A value of -0.26 means that if prices increase by 10%, demand will decrease by 2.6%.

[33] Thus, while the total of such costs will vary to the EDB based on the number of customers, they can be considered fixed from the point of view of an individual customer.

[34] Noting that capacity-based charges which are based on some *measure* of capacity that a consumer can influence (including connection capacity), should be considered variable in this context.

- do not result in the variable[35] prices to consumers being at materially different levels to the underlying values for the cost-drivers.

Given that the range encompassed by 'incremental' to 'standalone' is so broad that it is likely to capture the vast majority of cost allocation approaches, it is likely that the second bullet point will be significantly more important in terms of achieving economically efficient outcomes consistent with the intent of the Principles.

That said, where EDBs are aware of significant levels of cross-subsidy (e.g. due to historic decisions relating to rural-urban factors, which a number of EDBs indicated were significant on their networks), it is suggested that EDBs provide information on the scale of such effects. This is because it is understood there is considerable variation between EDBs regarding rural-urban pricing approaches, and the provision of such information would facilitate provision of guidance by the Government or Authority if that was judged to be desirable.

It is further suggested that EDBs should be required to provide some analysis of the extent to which they have considered the transaction cost implications from the complexity / simplicity of their chosen approach, and any trade-offs between achieving transaction cost savings through simplicity and potential economic impacts from altered consumer outcomes from such simplicity (e.g. altered customer location decisions).

Specific variation in approaches to customer grouping and cost allocation based on customer location

After peak demand, one of the next most significant drivers of EDBs' costs was identified as being customer location[36].

However, it was noted that distributors adopt materially different approaches to cost allocation based on the location of such customers. Accordingly, it has been considered specifically here.

The observed variation in approach ranged from those who have no locational element to their pricing approach, to those who still retain a strong locational aspect to their charging. Increasingly, it appears that EDBs are moving to the former approach, and it is understood that one key driver behind such 'simplification' initiatives is to capture some of the operating efficiencies of such simpler approaches in terms of reduced transaction costs.

However, if customers alter their location decisions based on distribution pricing, then not reflecting location in their charges could result in economically inefficient outcomes.

In evaluating whether this is likely to be the case, it has been considered that electricity costs are generally a small component of consumers' overall costs, and in value terms, the relative electricity costs associated with different locations tends to be significantly smaller in importance relative to:

- For business consumers: proximity to other factory inputs (including raw materials, and labour)[37]; and/or proximity to markets.

[35] Noting that 'variable' should also encompass all $/kW or $/kVA capacity-based charges over which consumers have the ability to influence the level of such charges based on their behaviour.

[36] i.e. customers that are located some distance from a transformer will impose greater wires costs compared to those that are next door to a transformer. Similarly customers that are densely located close together will impose proportionately much lower wires and transformer costs than customers that are 'spread-out' and thus don't share network assets to the same extent.

[37] There will be some electricity-intensive business consumers for whom electricity costs are one of the most significant costs. However:

- many such consumers are the super-large industrials that tend to be directly connected to the transmission network; and
- most such consumers' location decisions tend to be driven by proximity to particular raw materials.

- For residential consumers: proximity to work, family, schools etc.

Accordingly, it is considered that for the vast majority of consumers, their location decisions will not be influenced by electricity costs[38].

To the extent that this is the case (and it should be noted that no quantitative evaluation has been undertaken for this review to substantiate this qualitative assessment), then not reflecting location in distribution charges will be unlikely to result in economically inefficient outcomes – i.e. the simplification initiatives are unlikely to result in material changes in consumers' location decisions and thus EDBs' costs. Indeed, by lowering the transaction costs associated with large numbers of customer groups, economic efficiency gains could be achieved.

The main potential exception to this relates to particular rural locations where the 'true' un-subsidised cost of supply could be considerably greater than current charges. However, no analysis has been done to consider the potential impact on such customers of a move to greater cost-reflective pricing in terms of their location decisions.

Indeed, no quantitative analysis has been done at all to substantiate the qualitative assessment set out above that electricity distribution costs will generally not influence consumers' location decisions.

Based on such simplified analysis, it is suggested that for the 2012 review, EDBs should be required to provide some analysis of the extent to which they have considered the potential outcomes of altered locational decisions from their pricing approach, versus any transaction cost implications from the complexity / simplicity of such an approach.

Analysis of the variation in approach to tariff structures

A simple quantitative comparison of the different EDBs' tariffs was carried out as follows:

- Three hypothetical customers were considered:
  - A domestic 8,000kWh consumer;
  - A non-domestic 8,000kWh consumer; and
  - A 650,000kWh per annum TOU commercial customer[39].
- Two key aspects of the tariffs for such customers were considered:
  - The effective price signal at times of system peak
  - The proportions of the various different types of charge components (i.e. fixed, connection capacity, anytime maximum demand, coincident peak demand, peak kWh, other kWh)

The purpose of such high level comparisons was to determine whether the significant variation in approaches adopted by the different EDBs was translating into significant variation in the nature and scale of price signals to consumers – both *between* network areas, and between customer types *within* a given network area.

If there is no such significant variation in effective price signals it might indicate that all EDBs had consistently applied the Pricing Principles.

[38] This is not to say that electricity costs will not affect the nature of consumers' *consumption* decisions at a particular location. As set out in previous sections, many consumers have been observed to actively implement demand-side management measures in response to distribution price signals.

[39] Assumed to have a 200kVA connection to the low voltage network, with consumption predominantly during a 12 hour working day during weekdays with a fairly flat profile during such periods

However, if significant variation does exist, it could indicate:

a) Some EDBs ***not applying the Pricing Principles*** when developing their tariffs;

b) EDBs ***applying the Pricing Principles inconsistently*** (possibly through different interpretations of what they mean);

c) Consistent application of the Pricing Principles by the different EDBs, but significant ***variation in the nature of the different network areas and/or customer types*** which justifiably results in different pricing approaches; or

d) ***Some combination of the above***.

Effective price signal at times of system peak

As set out in section 5.2 above, all nine EDBs stated that meeting peak demand was the most significant driver of their costs[40]. Therefore a comparison of the effective price signals of the EDBs' tariff structures was undertaken to determine whether:

- the price signals to TOU customers (who don't suffer from metering limitations in terms of being able to send price signals) at peak times are broadly consistent *between EDBs*; and
- the price signals to TOU customers at peak times are consistent with the price signal indicated by EDBs for the value of controlling hot water load during such peak periods – i.e. whether the price signals are consistent between customer types *within* a given network area.

Methodology for calculation

With respect to calculation of the effective TOU peak price signal, its purpose is to determine the effective c/kWh price signal that a TOU customer would face during the highest demand periods that comprise a network's system peak – i.e. the $ savings they would make from reducing demand at such times.

Given that there are many different charging methodologies, this requires a variety of different approaches to calculate.

For c/kWh charges, the peak demand charge is simply the c/kWh charge that applies during peak periods. For EDBs which only have an all year c/kWh charge this will be very low. However, for networks which have specific charges during defined peak periods, this can be much higher.

For demand charges (i.e. $/kVA or $/kW) the effective c/kWh charge is calculated as being the $/kW charge divided by the number of hours where this charge can apply.

For anytime maximum demand (AMD) charges the number of hours in which this can apply is generally very large resulting in a low effective c/kWh price at peak. Thus 240 weekdays multiplied by 8 hours during the working day where an anytime peak could occur, results in 1,920 hours. Some EDBs (e.g. Unison) apply further restrictions to their definition of the AMD window, which will reduce the number of hours (leading to an increase in the effective c/kWh price at peak.

[40] Only Orion quantified the extent to which peak was a cost-driver, stating that "*approximately 50% of our distribution costs are directly dependent on peak loading"*. (It should be noted that in this context, "distribution" doesn't include the transmission charges incurred by Orion – which in Orion's case appear to be 82% driven by peak demand. Using the information provided by Orion in its Pricing Methodology document on transmission and distribution costs, an overall estimate of the extent to which Orion's total costs (including transmission charges) are driven by peak loading has been estimated to be 59%)

For coincident peak demand (CPD)[41], the number of hours in which this can apply is generally lower, but varies according to the EDB's definition of peak. Orion's is most extreme with approximately 100 hours a year classed as peak periods for charging purposes resulting in a high effective c/kWh price at peak. Others are less narrow. For example, Unison classes its on-peak period as being weekdays during the five winter months of the year and for the periods of 7am-11 am and 5pm to 9pm (i.e. 8 hrs in the working day). This gives 869 peak charging hours, however for the purposes of the calculation this has been reduced to 652 effective peak charging hours as it has been assumed for the hypothetical TOU consumer that they would be unlikely to have significant demand after 7pm.

With respect to calculation of the c/kWh value to EDBs of hot water control during peak, this was calculated as:

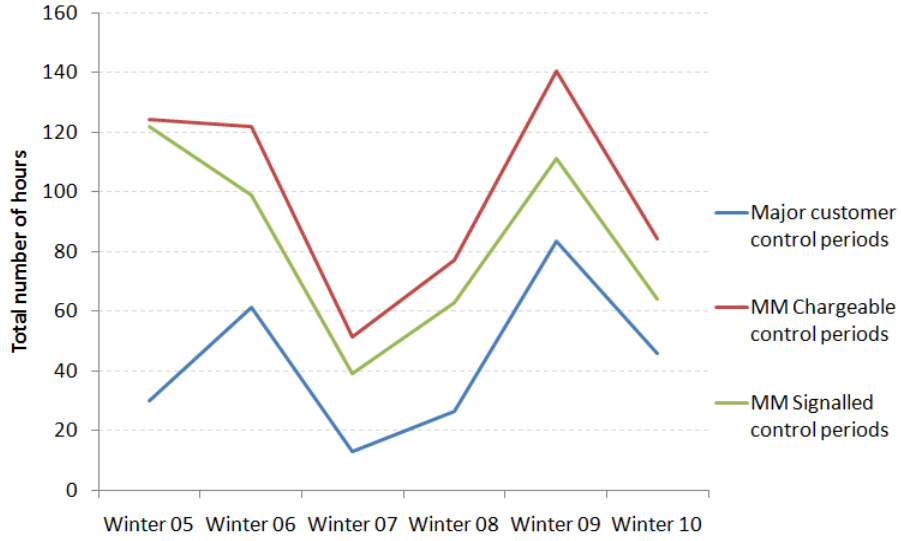
(Revenue foregone by EDB in granting a HW discount) ÷ (kWh of HW load control gained)

The numerator is calculated as:

- any c/kWh discount on a controlled tariff relative to an uncontrolled tariff, multiplied by the number of kWh of HW demand (which is assumed to be 40% of an overall 8,000kWh/annum load = 3,200kWh); **plus**
- any $/day discount on fixed charges for installations with control relative to uncontrolled installations multiplied by 365.

With respect to the denominator, it is assumed that the EDB gains the rights to 100 kWh of HW load control – being 100 hours controlling a 1kW load. The 100 hours estimate was based on data published by Orion on the number of hours it controlled load as illustrated by the following figure.

Figure 3: Historic number of Orion control periods by year



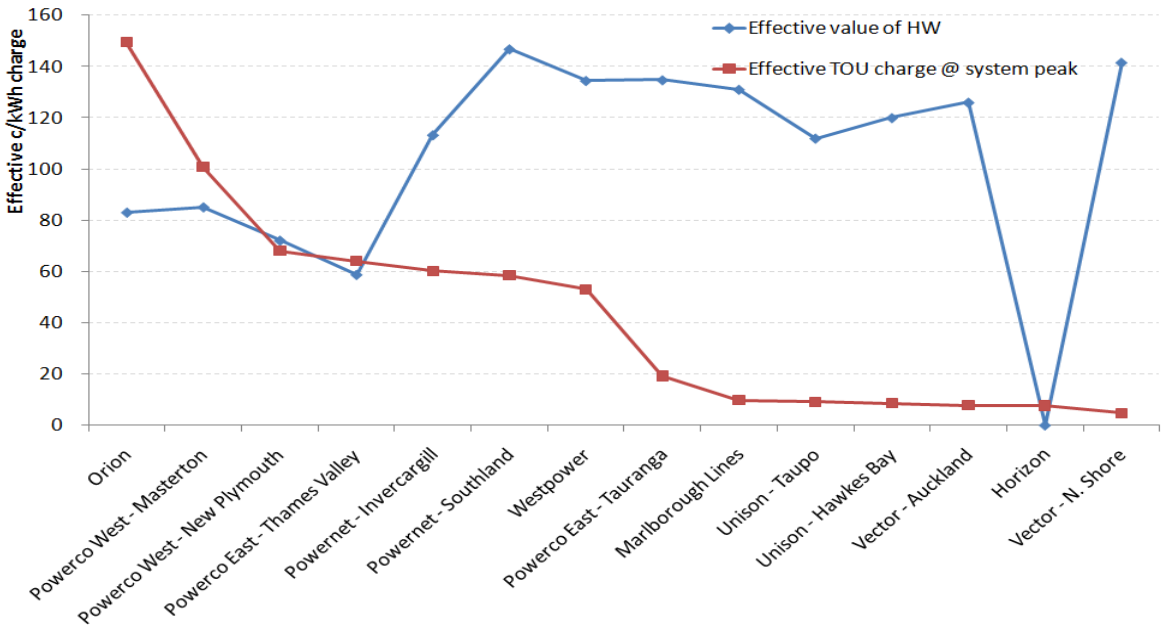
Source: Concept analysis based on Orion data

Results of calculation

The result of such comparative analysis is presented in Figure 4 below.

[41] Also known as 'after diversity maximum demand'

Figure 4: Comparison of the effective price signal faced by TOU consumers at times of system peak, with the apparent value ascribed by the EDBs to controlling hot water load during such peak periods[42]



Source: Concept analysis

As can be seen, there is major variation in the effective price signal to customers between network areas. It is not known whether such variation is due to radically different cost drivers between the network areas (e.g. some networks not needing to make investments to meet demand growth, or the cost of building new capacity to meet demand growth being radically different between different network areas), or due to inconsistent application of the Pricing Principles by the different EDBs. However, the fact that those EDBs who manage multiple network areas tend to adopt common tariff structures even when such network areas have very different characteristics (e.g. urban versus rural), appears to suggest that variation in network characteristics may not be the main explanation for the observed variation in pricing outcomes.

Further, many EDBs (particularly those who don't send a strong TOU peak price signal) appear to signal a very different value for peak load control to their TOU customers than to their hot water load customers. The scale of such variation is considered to be materially greater than the margin for error introduced by the relatively simple methodology used for conducting such comparison. It is not clear why there should be this apparently inconsistent price signal to different customers[43].

[42] The Lines Company's pricing is not included because it was not clear until relatively late in the review (by which time this analysis had been completed) whether The Lines Company would be publishing an updated pricing methodology for 2011.

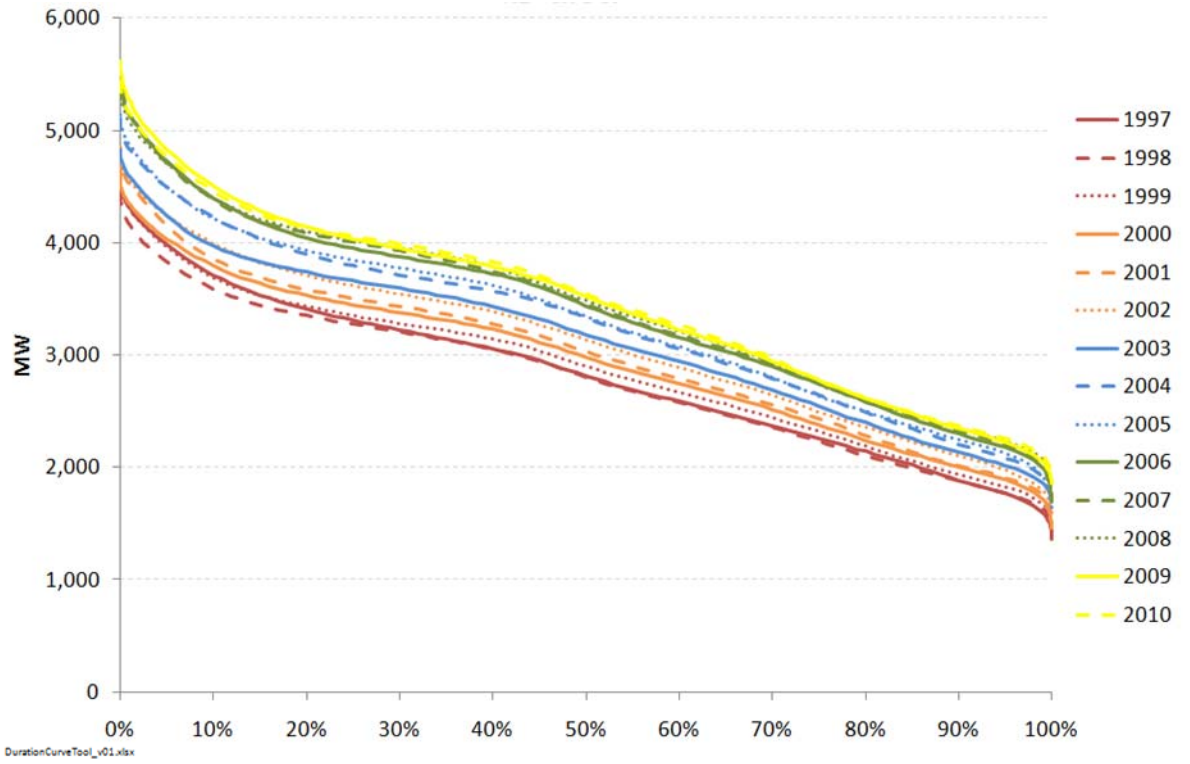
[43] One of the most consistent network companies was Horizon who send very little peak price signal to either class of customer. When asked about this, Horizon indicated this was because they saw very little benefit of peak control given that demand growth had been flat on their network and thus was unlikely to cause capacity constraints in the near future.

Potential implications of variation in peak price signals

Given that there is there significant observed variation in the nature and scale of peak price signals to consumers, the next stage of the analysis attempted to determine whether this may result in material variations in the economic efficiency of outcomes.

The first step was to undertake a simple comparison of demand growth rates in the different network areas, particularly peak demand growth rates. Figure 5 shows the first part of this analysis for New Zealand as a whole.

Figure 5: Historic load duration curves for the whole of New Zealand, excluding direct connect (DC) customers[44]



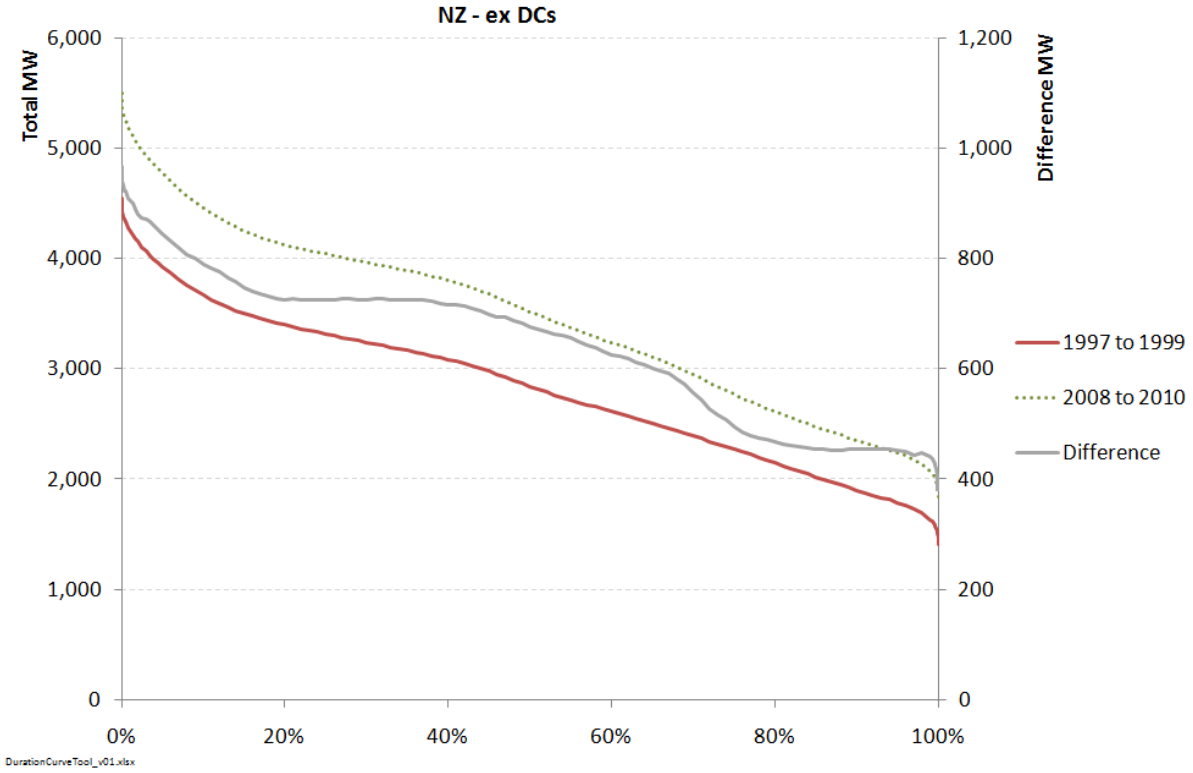
Source: Concept analysis using Electricity Authority centralised data set data

As can be seen, there has been progressive growth in demand for both peak and off-peak periods.

[44] Direct connect customers refer to those extremely large industrials who are directly connected to the transmission network, rather than a local distribution network.

Figure 6 below takes the above data and looks at the difference between the first and last years of the series[45]. The 'Difference' line illustrates how the absolute magnitude of MW demand growth over this period has been considerably greater for peak periods rather than off peak periods.

Figure 6: Illustration of the different absolute level of demand growth for peak and off-peak periods for the whole of New Zealand, excluding direct-connect customers

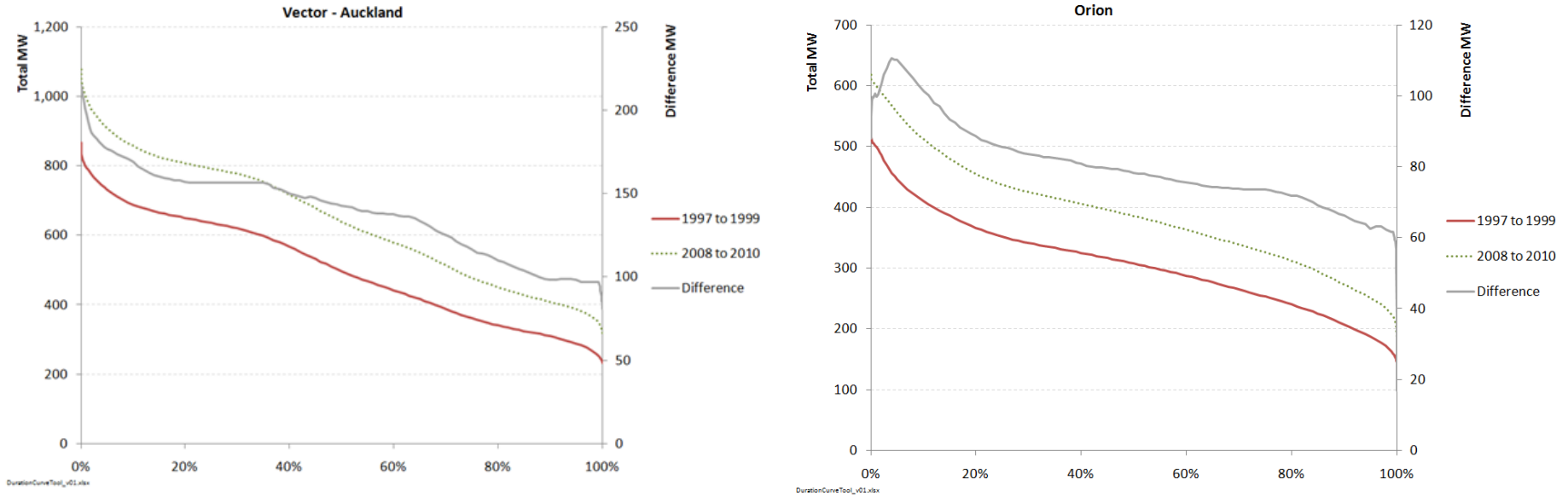


Source: Concept analysis using Electricity Authority centralised data set data

[45] Rather than simply take the first and last year of the series, an average of the first three and the last three years of the series has been taken to help reduce the effect of weather-related unusually high or low individual years.

This analysis was repeated at the level of individual network company areas (again excluding load from any directly connected industrial customers that happen to be physically located in a network company's area). For example, Figure 7 below shows the analysis for the Vector – Auckland and Orion network areas.

Figure 7: Illustration of the different absolute levels of demand growth for peak and off-peak periods for the Vector – Auckland, and Orion network areas, excluding direct-connect customers

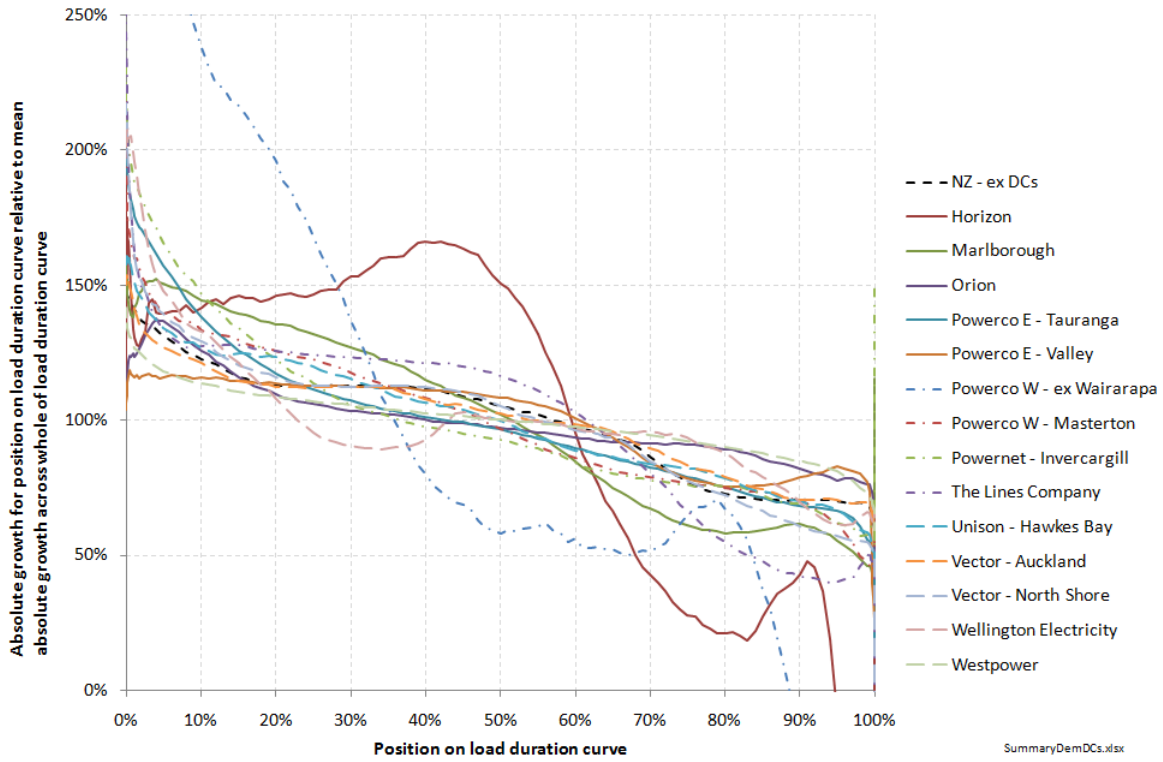


Source: Concept analysis using Electricity Authority centralised data set data

As can be seen, the general shape of demand growth for both the Vector- Auckland and Orion areas is similar to the whole of New Zealand, except for at times of peak demand. At such peak periods, it appears that the rate of demand growth in the Orion area is substantially less than is observed for both the whole of New Zealand and Vector – Auckland.

Another way of looking at this is to consider the absolute growth for each position on the load duration curve relative to the mean absolute growth across the whole of the load duration curve. This effectively 'normalises' the Difference curves above to take account of networks with different sizes.

Figure 8: Comparison of 'normalised' absolute growth rates across the different points of load duration curves for the period 1997 to 2010 (excluding Direct Connect customers)

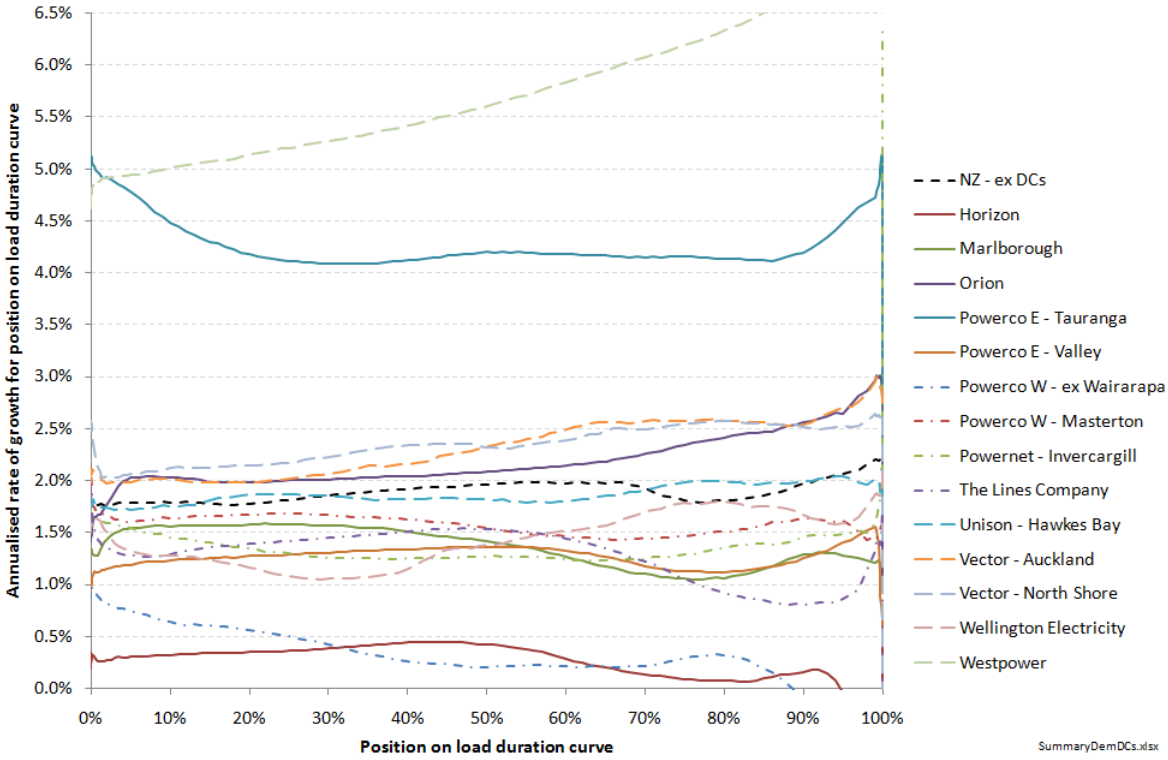


Source: Concept analysis using Electricity Authority centralised data set data

As can be seen, the absolute growth rates at peak have been generally higher than for off peak periods for all nine EDBs considered. However, there is some considerable variation of the LDC shapes, with Powerco W – ex Wairarapa and Horizon particularly appearing to be 'unusual'. No detailed analysis has been done to determine the cause of such unusual shapes.

This analysis was developed further by using the 'Difference' lines in the above figures, and calculating the effective annual rate of demand growth at different points on the load duration curve for the different network areas. This is shown in Figure 9 below.

Figure 9: Effective annualised rate of demand growth from 1997 to 2010 across EDB's load duration curves



Source: Concept analysis using Electricity Authority centralised data set data

As can be seen, for some networks and New Zealand as a whole, although the *absolute MW* rate of growth has been greater at peak demand periods, the *rate* of growth has been higher in low demand periods. For other networks, both the absolute level and rate of growth has been higher in peak periods.

Apart from at peak times, Orion's rate and shape of demand growth is very closely matched with that of Vector's Auckland and North Shore areas, which tends to suggest that the nature of the growth in the customer base is broadly similar in Auckland and Christchurch.

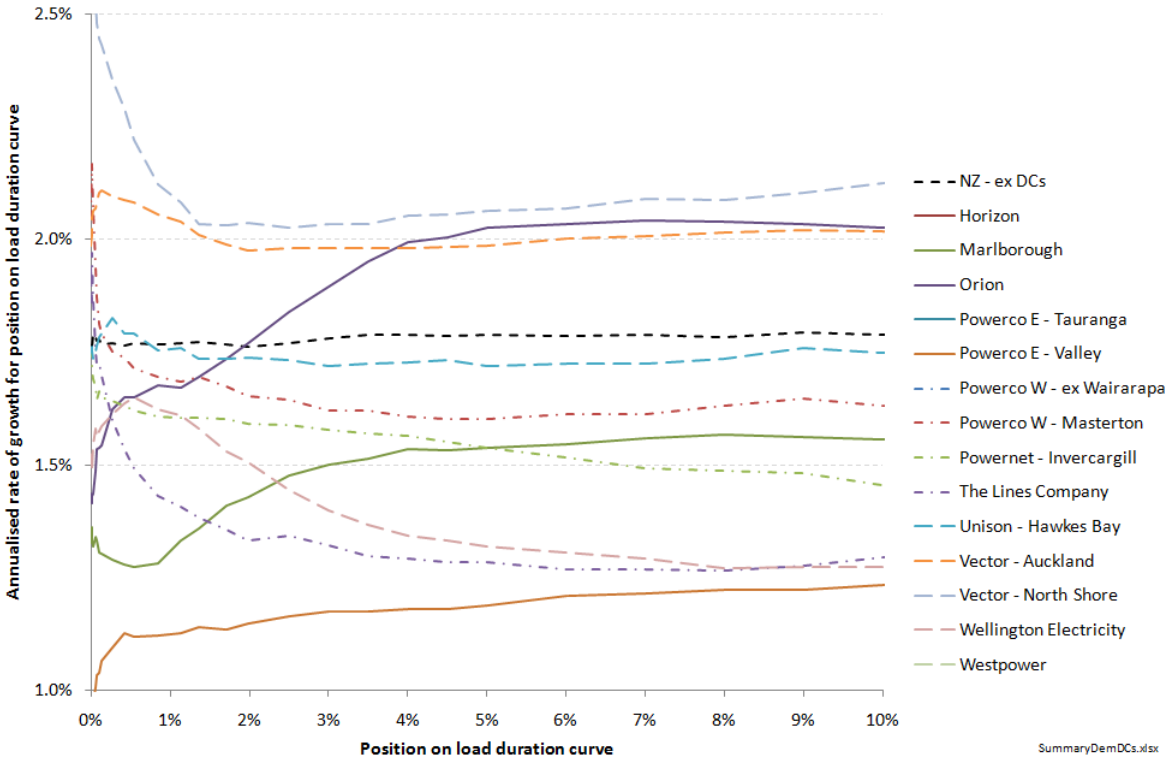
As can be seen, there are many different rates of demand growth for the other EDBs. For example, Horizon has had very little growth, whereas Westpower appears to have had a huge rate of demand growth of approximately 5.5% per annum on average. (Although closer examination of the data (not published here) suggests that this was the result of a couple of significant new connections who were large relative to the size of the network).

Other EDBs also have apparently unusual features which in many cases, on closer examination, appear to be the result of a few major step changes that were large relative to the size of the network.

Such 'unusual' features notwithstanding, the purpose of the analysis was to inform consideration of the implication of different peak pricing approaches adopted by the different EDBs. To aid such consideration, Figure 10 below just shows the top 10% of the load duration growth rate curves, and

compares those EDBs who have relatively similar rates of demand growth for this top 10% of the duration curve.

Figure 10: Effective annualised rate of demand growth from 1997 to 2010 for the top 10% of EDB's load duration curves



Source: Concept analysis using Electricity Authority centralised data set data

As set out earlier, Orion was one of the network companies which in their pricing methodology placed greatest emphasis on sending strong peak pricing signals in order to deliver efficient long-term outcomes.

As can be seen in Figure 10 above, Orion's peak demand growth over this period was 1.44% per annum, whereas if the shape of its demand growth rate curve was more typical of most of the other network areas, it would be expected to be closer to 2.1% to 2.4% - i.e. a reduction in peak growth rates of approximately 0.66% to 0.96% per annum.

It is not known the extent to which this reduction in Orion's peak demand growth is due to Orion's pricing approach or other factors. However, in MW growth terms this apparent 0.66% to 0.96% reduction in annual peak growth rates equates to approximately 50MW to 73MW avoided peak demand growth over the period 1997 to 2010 period, or approximately 10% of Orion's 1997 peak demand level. (Orion's own estimates set out in their asset management plan put the quantity of peak MW saved due to their initiatives (including hot water control and pricing) as being 200MW[46]).

Using Orion's estimate of LRAIC of $105/kW/year, this equates to savings of approximately $5m to $7.5m per annum on distribution costs (i.e. excluding any savings in transmission and peak generation costs). Offsetting this cost saving, there needs to be consideration of the potential value of useful consumption foregone at such peak times. This could be up to half the benefit of the avoided costs.

To the extent that this analysis is correct, there appears to be a significant net benefit to Christchurch customers. And when potential transmission and peak generation savings are taken

[46] (Orion, April 2010), page 163.

into account, this reduction in peak Christchurch load growth could deliver broader benefits to New Zealand consumers as a whole.

In summary, as noted above, this analysis has been highly simplified, and hasn't considered the extent to which there may be good reasons why the different network characteristics may dictate the different EDBs adopting different peak pricing methodologies.

However, it is considered that it has raised significant questions as to whether the different approaches may be due to the different EDBs having considered the Pricing Principles differently, and that the potential scale of economic inefficiencies if this were to be the case could be significant.

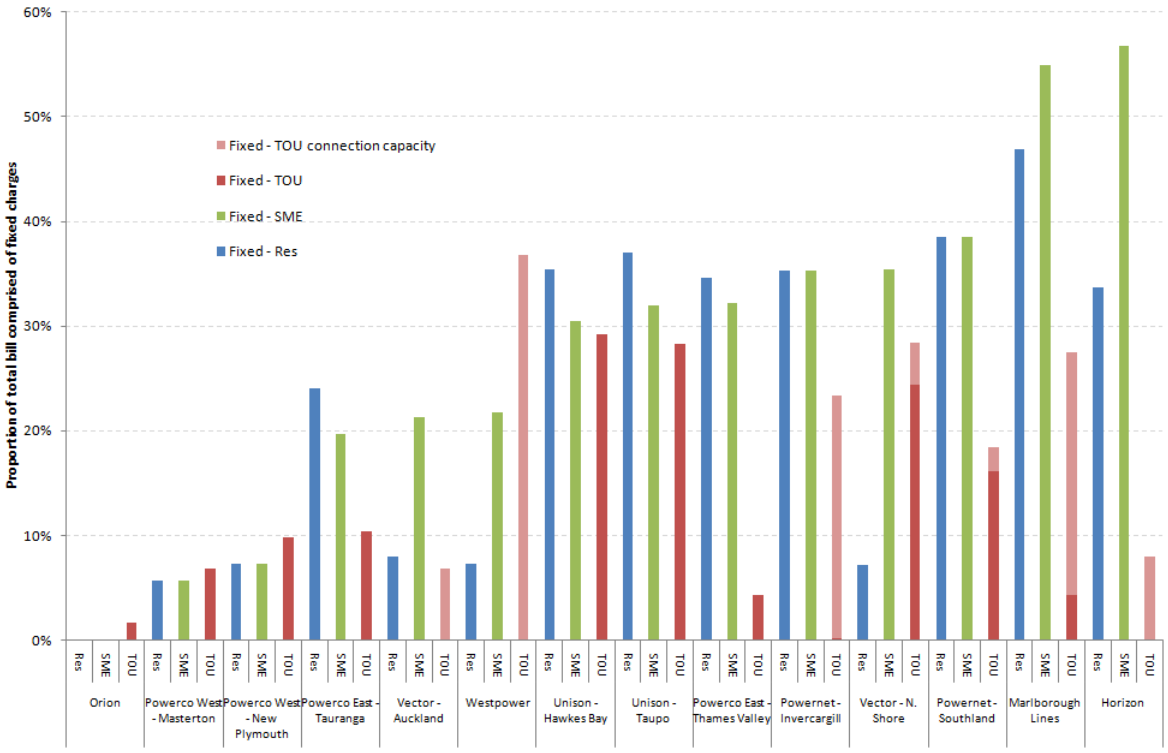
Proportions of different types of charges to the different consumers

None of the EDBs suggested that kWh energy growth was a material driver of distribution costs. However, many EDBs have indicated that they deliberately variablised for charging purposes many of their costs which were fixed, in order to help overcome barriers to energy efficiency.

Given this stated intent, and the observed significant variation in approaches with regards to the proportion of charges which are fixed, analysis was undertaken to determine whether the variation in approaches may be likely to result in material differences in the economic efficiency of outcomes.

Figure 11 below compares the proportion of the three hypothetical customers' bills which are based on fixed charges across the different EDBs.

Figure 11: Variation in proportions of fixed charges across the different EDBs



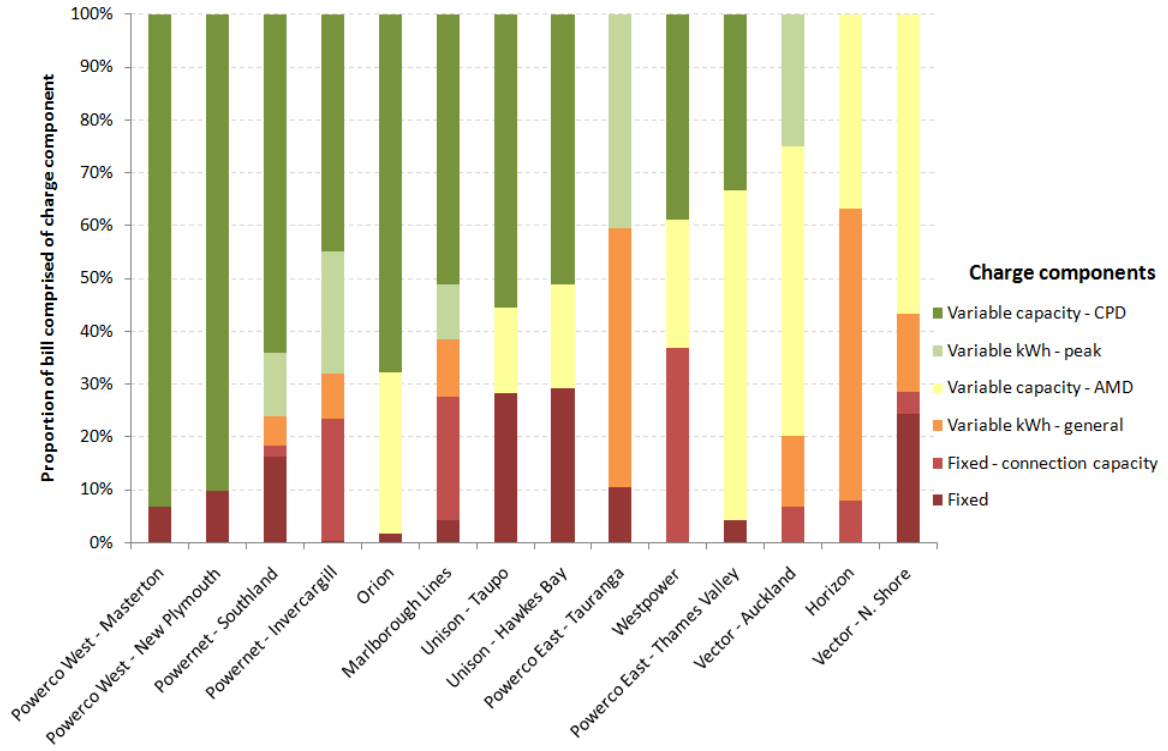
Source: Concept analysis

As can be seen, there is considerable variation in the proportion of fixed and variable charges between the different EDBs, and in some cases between different consumer types within an EDB's network area.

Again, it is not known whether this variation is indicative of fundamentally different cost drivers between the different network areas, or the different EDBs considering the Pricing Principles differently – e.g. different views on the extent to which variablising fixed costs should be used to address market failures associated with energy efficiency.

Figure 12 takes this comparison further for TOU customers through showing the breakdown among the different charge types.

Figure 12: Comparison of split of charge components for hypothetical TOU customer[47]



Source: Concept analysis

The order of the EDBs along the x-axis is through sorting according to the proportion of the bill which is based on peak-related charges. As can be seen, this order is very similar to the order shown in Figure 4 which is sorted according to the magnitude of effective price signal to TOU customers at times of peak.

As can be seen from Figure 11 and Figure 12, there is considerable variation in the extent to which EDBs use fixed charges to charge customers for use of their service – both between EDBs, and in some cases between customer types within a given EDB.

It is not known whether this significant difference in approach reflects significant differences in the situations between networks and between different customer types. However, to the extent that this is reflective of some EDBs variablising for pricing purposes costs which are fixed, or vice versa, there are three potential impacts that could arise from such practises:

- Wealth transfers between consumers;
- Potential economic efficiency impacts:

[47] CPD = coincident peak demand. AMD = anytime maximum demand. 'Capacity' charges includes $/kW and $/kVA approaches.

- allocative inefficiencies in terms of over-encouraging or dissuading consumers from using the electricity network to an efficient level; and
- Productive efficiency gains / losses, if variablising / fixing charges results in barriers to energy efficiency being eased / exacerbated.

Wealth transfer issues

With respect to wealth transfers, it is clearly the case that variablising fixed charges will result in total bills for low-consumption customers being reduced at the expense of high-consumption customers.

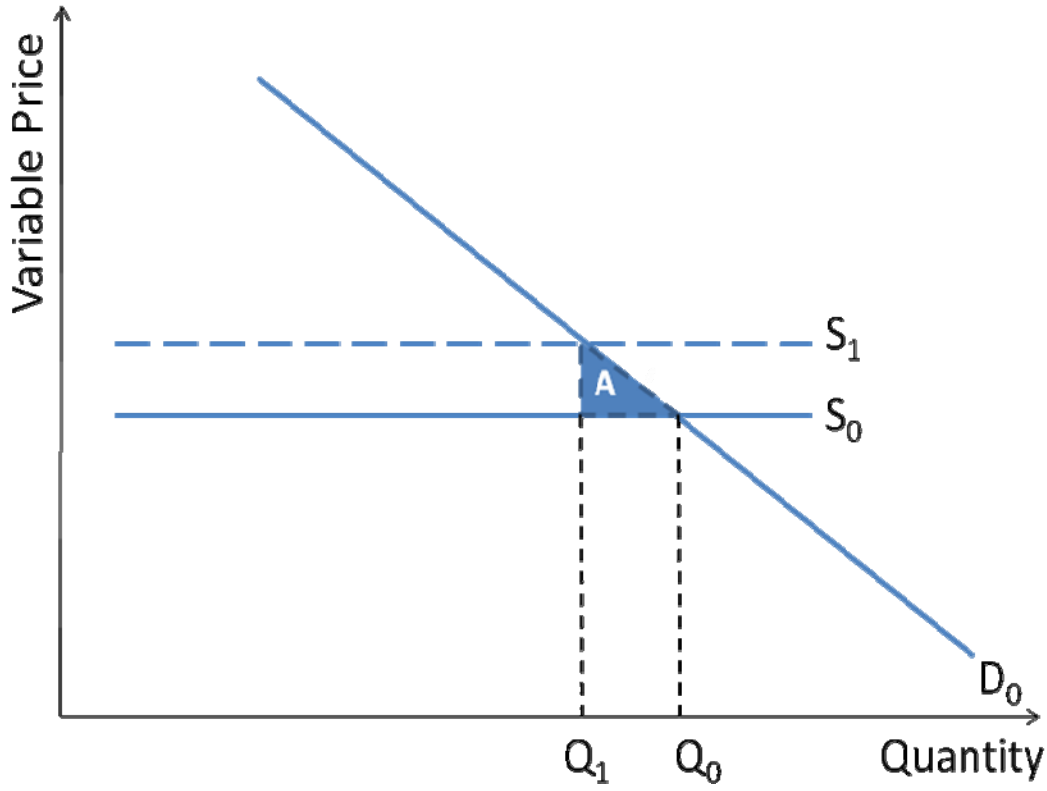
Such wealth transfers clearly raise public policy issues, particularly if wealthy low-consumption customers (e.g. bach owners) end up being cross-subsidised by low-income larger consumers. Much of this debate has already occurred with respect to concerns around the low-user charge – i.e. the requirement for distributors to offer a low-fixed charge option for domestic consumers.

It is beyond the scope of this review to address such issues, however it is understood that the Electricity Commission undertook a piece of work in this area which established that in general, low-users tended to be lower-income than high-users. However, it is likely that there will be significant exceptions to this general finding (e.g. bach owners, large low-income families etc.) whose magnitude of effect could vary from network to network.

Potential allocative inefficiencies

If an EDB were to variablise for pricing purposes costs that were fixed, a key concern is that some useful consumption of electricity would be curtailed due to the $/kWh price of electricity rising above the value of such consumption to consumers. If this were to happen it would represent an allocative efficiency loss. This is illustrated in the following diagram:

Figure 13: Illustration of potential allocative efficiency loss through variablising for charging purposes distribution costs which are fixed



Thus, the initial variable price of supply to consumers (i.e. ignoring any fixed charges) is S_0 which in this example is considered to be a 'true' reflection of the variable costs of supplying electricity, and which for simplicity of the illustration is assumed to be flat. Given the demand curve D_0, this led to a total demand for electricity of Q_0.

If some of the fixed costs of distribution were then variablised, this would give rise to the new variable supply price of S_1. Given the downward sloping demand curve (i.e. indicative of a price elasticity of demand <0), this results in a new demand for electricity Q_1. The reduction in fixed charges to consumers is not shown in the graph.

Thus, even though the aggregate total of variable and fixed distribution charges remains the same (because the increase in variable charges has been offset by a reduction in fixed charges), the impact of increasing the variable charge will result in a reduction in the demand for electricity, giving rise to an allocative efficiency loss equal to the shaded area A. i.e. this is the useful consumption foregone by increasing variable *price* above variable *cost*.

A similarly allocatively inefficient outcome would occur if the reverse situation occurred – i.e. the EDB lowering its variable charges through recovering costs that were variable through fixed charges.

Table 4 below sets out a simple calculation to get a feel for the potential order of magnitude of such allocative losses for the residential and commercial sectors.

Table 4: Estimate of potential allocative loss from either 'variablising' or 'fixing' prices at a level which doesn't reflect the 'correct' degree of variability of costs[48]

	Residential	Commercial	Source
Avg customer's bill ($)	2,000	8,539	From:
lines component ($)	642	2,773	MED QSDEP (Res)
Avg consumption (MWh)	7.6	60.4	MED EDF (Com)
Avg TWA wholesale price ($/MWh)	80.0	80.0	
DWA / TWA factor	1.10	1.09	Guesstimate based on historic shapes
Tx & Dx network losses	10%	9%	Guesstimate
Variable energy price (c/kWh)	9.68	9.50	Derived from above
Price elasticity of demand	-0.26	-0.26	From MDP CBA
Total NZ residential consumption (GWh)	12,400	9,300	From MED EDF
Note: All $ and GWh units are per annum figures			simonc: Based on Orion info

	Residential			Commercial		
	Fully fixed	'Correct'	Fully variable	Fully fixed	'Correct'	Fully variable
% variable	0%	59%	100%	0%	59%	100%
Average variable lines price (c/kWh)	0.00	4.98	8.44	0.00	2.71	4.59
Average variable energy price (c/kWh)	9.68	9.68	9.68	9.50	9.50	9.50
Total variable price (lines + energy) (c/kWh)	9.68	14.66	18.12	9.50	12.21	14.10
Change in total variable price relative to 59% fixed lines charge (%)	-34%	0%	24%	-22%	0%	15%
(c/kWh)	-4.98	0.00	3.46	-2.71	0.00	1.88
Change in quantity assuming -0.26 price elasticity of demand (%)	8.8%	0.0%	-6.1%	5.8%	0.0%	-4.0%
(GWh)	1,095	0	-761	536	0	-373
Allocative efficiency gain / (loss) from change in quantity ($m)	-27.3	0.0	-13.2	-7.3	0.0	-3.5

The allocative efficiency change is calculated as being equal to the difference in price, multiplied by the difference in the quantity, divided by 2. (i.e. the area of the triangle A in Figure 13 above).

As can be seen, the potential allocative inefficiency losses can be considerable both from over-variablising, or from over-fixing charges relative to the 'correct' level of variability of costs. Thus, using the above highly simplified approach and assumptions above, fully variablising distribution charges would result in a reduction in residential and commercial consumption, the combined value

[48] The estimate of the extent to which lines costs are variable was based on the information presented in footnote 40 relating to Orion's situation. It is likely that different networks will have a different level of cost variability, but no information has been provided to determine the extent of such differences. The -0.26 price-elasticity of demand is the value that was used in the Electricity Commission's 2010 cost-benefit analysis of its Market Development Programme.

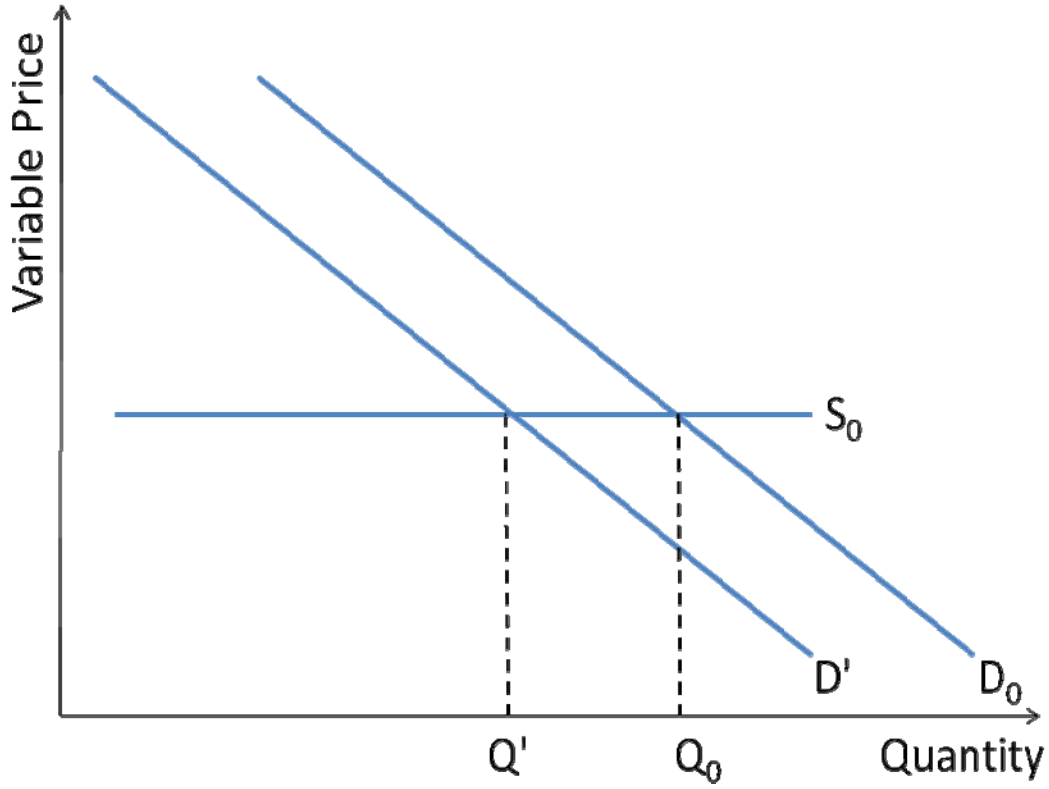
of which would equal an allocative loss of $16.7m per annum ($13.2m + $3.5m). Likewise, charging on a fully fixed basis would result in a combined allocative efficiency loss (through encouraging consumption whose value was below the cost of supply) of $34.6m.

Possible productive efficiency gains

A possible counter to such allocative inefficiencies may emerge if variablising charges to consumers helps address market barriers to consumers undertaking energy efficiency measures.

A stylised representation of the potential impact of such energy efficiency barriers on the demand for electricity is shown in the following diagram.

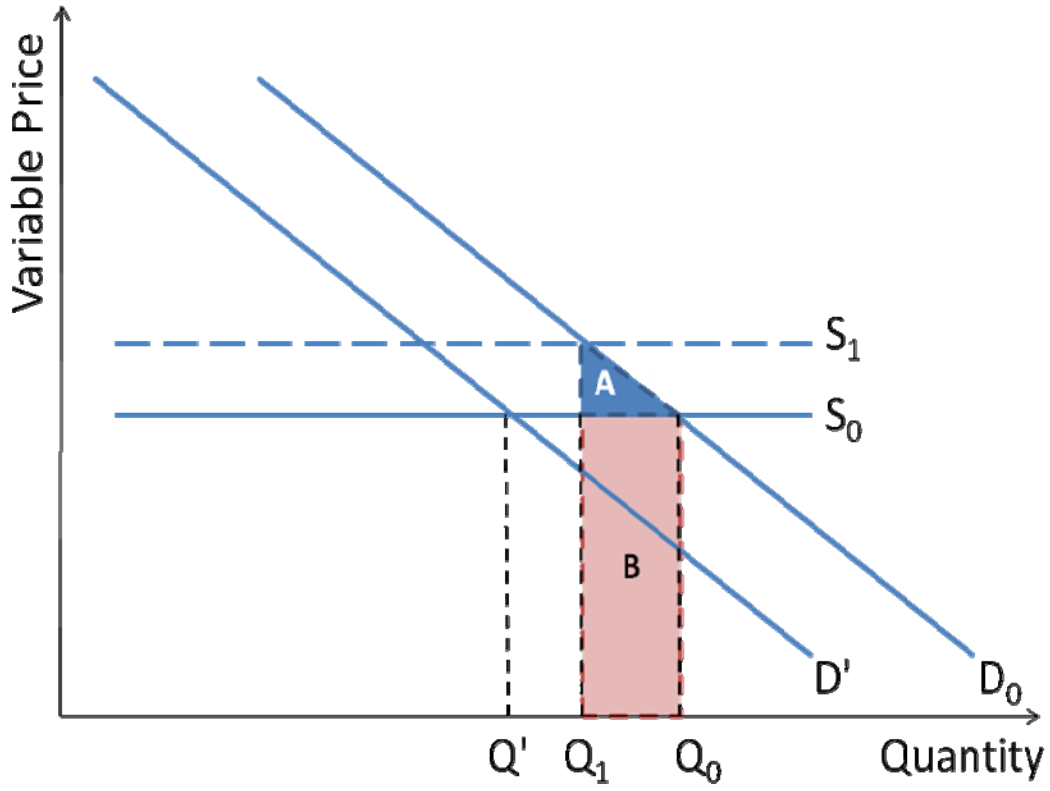
Figure 14: Illustration of the potential impact of energy efficiency barriers on the 'efficient' demand for electricity



Thus, the efficient demand curve for electricity would be D' which, for a supply cost S_0, would result in a demand for electricity of Q'. However, because of market barriers to energy efficiency the demand curve is D_0, resulting in a demand for electricity, Q_0, that is much greater than would be efficient.

In this context, variablising charges to give a variable price of S_1 and quantity of Q_1, will bring the demand for electricity back closer to the efficient level of Q'. This is illustrated in Figure 15 below which also highlights area B, being the productive efficiency gain from supply costs not being incurred to meet a level of demand that is inefficiently high.

Figure 15: Illustration of the potential productive efficiency gains from variablising for charging purposes distribution costs which are fixed if barriers to energy efficiency were causing demand to be materially greater than the efficient level.



The way Figure 15 is drawn indicates that the productive efficiency gains (area B) could be greater than any allocative efficiency losses (area A).

To consider whether this may be the case in the real world Table 5 below develops further the simple estimate set out in Table 4 above, through the addition of the rows shaded yellow.

Table 5: Estimate of potential productive efficiency gains, in addition to allocative losses, from either 'variablising' or 'fixing' prices at a level which doesn't reflect the 'correct' degree of variability of costs

	Residential	Commercial	Source
Avg customer's bill ($)	2,000	8,539	From:
lines component ($)	642	2,773	MED QSDEP (Res)
Avg consumption (MWh)	7.6	60.4	MED EDF (Com)
Avg TWA wholesale price ($/MWh)	80.0	80.0	
DWA / TWA factor	1.10	1.09	Guesstimate based on historic shapes
Tx & Dx network losses	10%	9%	Guesstimate
Variable energy price (c/kWh)	9.68	9.50	Derived from above
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Total NZ residential consumption (GWh)	12,400	9,300	From MED EDF
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	Residential			Commercial		
	Fully fixed	'Correct'	Fully variable	Fully fixed	'Correct'	Fully variable
% variable	0%	59%	100%	0%	59%	100%
Average variable lines price (c/kWh)	0.00	4.98	8.44	0.00	2.71	4.59
Average variable energy price (c/kWh)	9.68	9.68	9.68	9.50	9.50	9.50
Total variable price (lines + energy) (c/kWh)	9.68	14.66	18.12	9.50	12.21	14.10
Change in total variable price relative to 59% fixed lines charge (%)	-34%	0%	24%	-22%	0%	15%
(c/kWh)	-4.98	0.00	3.46	-2.71	0.00	1.88
Change in quantity assuming -0.26 price elasticity of demand (%)	8.8%	0.0%	-6.1%	5.8%	0.0%	-4.0%
(GWh)	1,095	0	-761	536	0	-373
Allocative efficiency gain / (loss) from change in quantity ($m)	-27.3	0.0	-13.2	-7.3	0.0	-3.5
Potential productive efficiency gain / (loss) ($m)	-106.0	0.0	73.7	-51.0	0.0	35.4
Net economic efficiency gain / (loss) ($m)	-133.3	0.0	60.5	-58.2	0.0	31.9
'Breakeven' energy-efficiency potential value (%)			1.10%			0.40%
(GWh)			136.0			36.9
Comparison with KEMA estimate of economic potential (GWh)			2,633.0			1,849.0

The change in productive efficiency is calculated as being the change in quantity, multiplied by the variable price[49].

Thus, using the above highly simplified approach and assumptions, fully variablising distribution charges would result in productive efficiency gains that are substantially greater than the allocative efficiency losses, provided there is a level of energy efficiency measures which aren't being taken up due to market barriers[50].

To get a feel for what this minimum level of unrealised energy efficiency potential as a result of market barriers would need to be, the bottom rows of Table 5 show 'breakeven' energy efficiency potential values, below which the allocative efficiency losses would outweigh any potential energy efficiency gains. In GWh terms these have been estimated to be 136 GWh and 36.9 GWh for residential and commercial customers respectively.

The last row also shows the economic energy efficiency potential for the residential and commercial sectors as estimated by Kema in a 2007 study for the Electricity Commission[51]. As can be seen, this economic potential is considerably greater than the 'breakeven' energy efficiency potential values

[49] An important point to note for the above calculations is that the productive gain / (loss) has only be valued at the variable *energy* price, as it is assumed that lines costs don't vary materially with kWh consumption. This is considered conservative in that a more comprehensive analysis should also consider over-variablising peak kW charges, which, to the extent that energy efficiency barriers to consumers' peak consumption decisions are also relevant, may also result in avoided distribution costs.

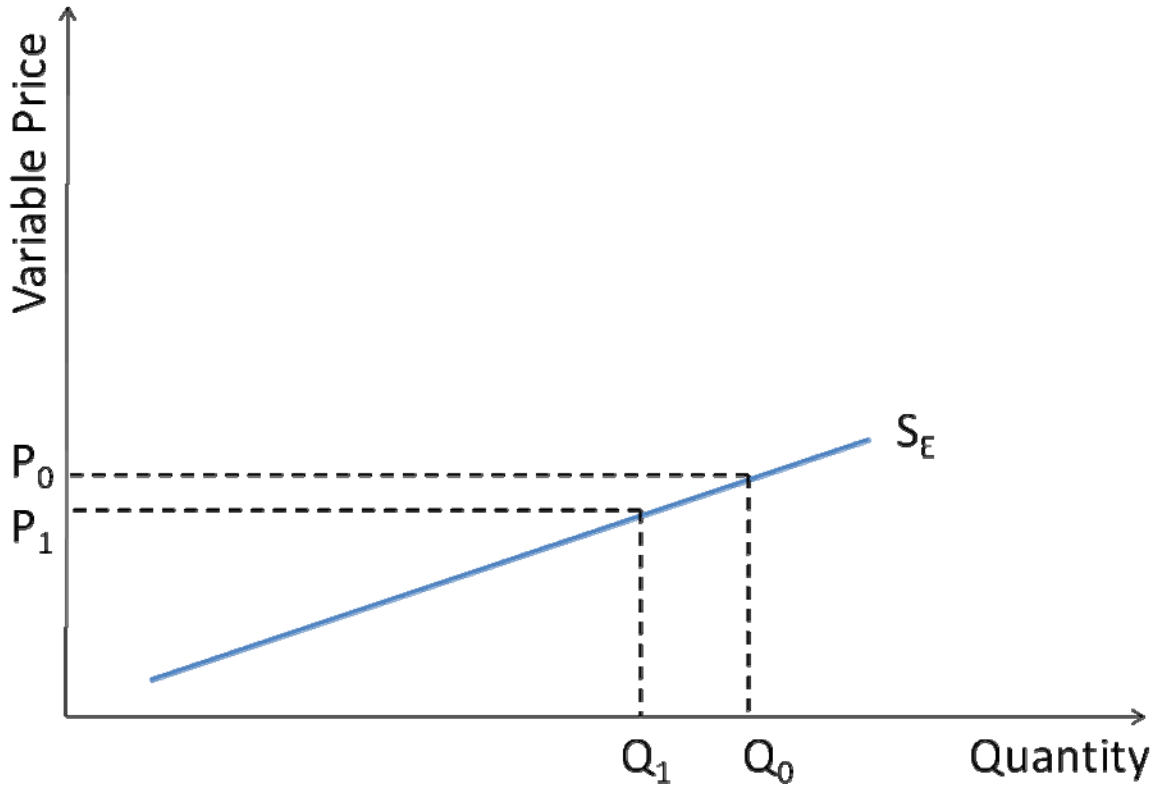
[50] I.e. provided the 'true' demand curve for electricity based on the value of consumption (analogous to curve D' in Figure 15 above) is lower than the observed demand curve (analogous to curve D_0 in Figure 15 above).

[51] (Kema, Sep 2007) page 49.

shown in the table, suggesting that it is possible that productive efficiency gains could outweigh allocative inefficiency outcomes.

A final point to note, is that variablising network charges may result in lowering wholesale energy *prices* (as well as costs). This is because, over time, wholesale prices should equate to the marginal economic new-entrant power station, and there is an upward sloping cost-supply curve for such new power stations (i.e. as the cheapest new-build options are used up, there will be a need to progressively access more expensive power station options). This is illustrated by Figure 16 below which shows just the variable energy component of supply costs S_E (i.e. ignoring lines costs), and showing the impact on energy prices due to a movement in demand from Q_0 to Q_1.

Figure 16: Illustration of impact on energy prices due to reduction in demand



If it is assumed that the slope of the new-build cost supply curve is approximately \$1.50/MWh per TWh/yr demand growth (i.e. for every TWh of annual demand growth, prices will be approximately \$1.50/MWh higher than they would otherwise have been)[52], then the 1,134 GWh of demand reduction shown in Table 5 (i.e. residential + commercial demand reduction) due to fully variablising demand charges would result in wholesale electricity prices for all consumers being reduced by \$1.70/MWh.

In summary, the above analysis, although it is highly simplified and doesn't capture all aspects of such issues[53], appears to illustrate that there could be material differences in the economic efficiency of the different charging approaches adopted by EDBs with respect to the proportion of costs which are recovered as fixed charges.

[52] Such an estimate is consistent with published new-entrant cost-supply curves from the likes of the MED.

[53] For example, one EDB has previously indicated concern that variablising network costs would result in excessive up-take of solar PV technology by consumers.

If there exists a considerable proportion of un-realised economic energy efficiency measures due to market failures, then the analysis appears to suggest that variablising fixed network charges could potentially result in an overall economic efficiency gain for New Zealand as a whole – i.e. the productive efficiency gains could outweigh any allocative efficiency losses.

However, to the extent that net efficiency benefits may occur from such 'variablisation' approaches, no analysis has been undertaken as to whether using distribution pricing to overcome barriers to energy efficiency is the 'best' approach to such barriers relative to other possible interventions, or how the net benefit of such 'variablisation' approaches may vary when considered in conjunction with other interventions to address energy efficiency barriers.