

Input methodologies review draft decisions

Topic paper 3: The future impact of emerging technologies in the energy sector

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Associated documents

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16 June 2016	978-1-869455-08-8	Input methodologies review draft decisions: Summary paper
16 June 2016	978-1-869455-09-5	Input methodologies review draft decisions: Introduction and process paper
16 June 2016	978-1-869455-10-1	Input methodologies review draft decisions: Framework for the IM review
16 June 2016	978-1-869455-11-8	Input methodologies review draft decisions: Topic paper 1 – Form of control and RAB indexation for EDBs, GPBs and Transpower
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22 June 2016 (expected)	978-1-869455-16-3	Input methodologies review draft decisions: Report on the IM review
22 June 2016 (expected)	1178-2560	Draft amendments to <i>Electricity Distribution Services Input Methodologies Determination 2012</i> [2012] NZCC 26
22 June 2016 (expected)	1178-2560	Draft amendments to <i>Gas Distribution Services Input Methodologies Determination 2012</i> [2012] NZCC 27
22 June 2016 (expected)	1178-2560	Draft amendments to <i>Gas Transmission Services Input Methodologies Determination 2012</i> [2012] NZCC 28
22 June 2016 (expected)	1178-2560	Draft amendments to <i>Commerce Act (Specified Airport Services Input Methodologies) Determination 2010</i> (Decision 709, 22 December 2010)
22 June 2016 (expected)	1178-2560	Draft amendments to <i>Transpower Input Methodologies Determination 2012</i> [2012] NZCC 17

Commerce Commission
Wellington, New Zealand

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Executive summary

Purpose of this paper

- X1. The purpose of this paper is to:
 - X1.1 summarise our understanding of the changing energy landscape, the Commission’s role as an economic regulator in that context, and the impacts of some emerging technologies on the input methodologies (**IMs**).
 - X1.2 explain in relation to the emerging technology topic:
 - X1.2.1 the problems we have identified within this topic area;
 - X1.2.2 our proposed solutions to these problems; and
 - X1.2.3 the reasons for our proposed solutions; and
 - X1.3 explain how we have taken stakeholders’ submissions into account in considering the above, in identifying problems for the IM review, and in reaching our proposed solutions to problems identified within this topic.
- X2. All of the proposed solutions and changes to IMs described within this paper apply to electricity distribution businesses (**EDBs**).
- X3. This paper may also be of particular interest to:
 - X3.1 gas pipeline businesses (**GPBs**) as we propose that the changes to the cost allocation IM presented in Chapter 4 (Regulatory treatment of revenues and costs from emerging technologies) would also apply to them;
 - X3.2 gas distribution businesses (**GDBs**) who may consider they face an increased risk of partial capital recovery, although potentially for different reasons than EDBs (discussed in Chapter 3 – Partial capital recovery);
 - X3.3 electricity retailers who raised concerns about ensuring there is a ‘level playing field’ between regulated and non-regulated markets. Chapter 4 (Regulatory treatment of revenues and costs from emerging technologies) discusses this issue; and
 - X3.4 other parties interested in emerging technologies, such as Transpower, gas transmission businesses, and consumer groups.

Overview of the emerging technologies topic

- X4. We are very aware of the potential for significant change to arise from the combination of falling costs, improving performance and increasing capabilities of some new technologies, new business models (especially in the space currently occupied by EDBs and electricity retailers), and evolving consumer preferences. These developments present opportunities and challenges for EDBs, and have the potential to deliver significant benefits to consumers.

- X5. It is not clear how EDBs will respond to these changes and opportunities but it seems that the boundaries between participants in different vertical segments of the electricity market may be blurred, which may require changes to legislation or regulations.
- X6. We have therefore reviewed the IMs to test their fitness for purpose in this changing environment. Based on the information available to us, we do not currently consider that major changes to the IMs are needed at this time.
- X7. We would not want the IMs or our regulatory regime more generally to discourage suppliers (or others) from using new technology and new business models for their and consumers' benefit. Our view is that the IMs can deal appropriately with likely developments, but we will need to continue to engage with stakeholders, including government agencies, on how the sector is developing and any changes that may be required to the IMs or other regulatory and policy settings in the future. We have the ability to revisit the IMs in response to emerging developments when they arise.
- X8. We consider that the available evidence is inconclusive on whether the risk of partial capital recovery for EDBs' regulated businesses has increased, and by how much. We consider that partial capital recovery seems unlikely to be a significant concern in the short term, but may be an issue over the longer term. The longer-term view on how electricity networks might be used in the future has become more uncertain compared to 2010.
- X9. However, as a precautionary measure, we propose to allow EDBs to recover the cost of assets more quickly. In particular, we propose to offer EDBs the option to apply for a net present value (**NPV**) neutral shortening of their remaining asset lives. This would be capped at a 15% reduction in remaining average asset lives as compared to the situation at the time of the DPP reset. This measure has been designed to ensure that total cost to consumers does not increase, in NPV terms, over the life of the assets. So, if suppliers exercise the asset shortening option at the next reset in 2020, prices to consumers would rise moderately in the short term and fall in the longer term, compared to the status quo.
- X10. This initiative signals our willingness to amend the IMs in the face of emerging developments, and to move early to give suppliers better confidence to invest as well as avoiding subsequent "regulatory catch up", which could lead to large future price shocks. We have heard very little on the risk of partial capital recovery from GPBs and would welcome further submissions on this point.
- X11. Some stakeholders (mainly electricity retailers) expressed significant concern with electricity distributors entering unregulated energy markets. Their key concern is that EDBs' status as a regulated monopoly provider and the rules applied to them, especially the cost allocation IM, may give them an undue competitive advantage in, or otherwise distort, competitive energy markets (either existing or new).

- X12. In our judgement, matters of industry structure are more appropriately handled by policy makers. The current cost allocation IM is intended to ensure that consumers of regulated services benefit over time from any efficiency gains achieved by EDBs supplying regulated and unregulated services together. We consider the current cost allocation IM is largely fit for purpose, though we have proposed changes to tighten some aspects of this IM and to gather further information which will be used in informing future monitoring and analysis. These changes are noted in Table X1 below.
- X13. Table X1 summarises the areas in this topic where our analysis has led to changes in the IMs. There are other issues that we have considered in relation to this topic which have not resulted in changes; these issues are discussed as part of the following chapters in this paper.

Table X1: Summary of proposed changes in relation to this topic

Proposed change	Outcomes of the proposed change	Chapter
<p>We propose to amend the IMs to allow EDBs, at the time of the default price-quality path (DPP) reset, to apply for a discretionary NPV neutral shortening of their remaining asset lives. This would be capped at a 15% reduction in remaining average asset lives as compared to the situation at the time of the DPP reset.</p>	<p>Allowing EDBs the option of a more rapid time profile of capital recovery is a precautionary measure to address increasing uncertainty regarding the risk of partial capital recovery.</p> <p>This proposed change mitigates the risk of potential future price shocks for consumers, which would likely be required to maintain the expectation of <i>ex-ante</i> financial capital maintenance (FCM) if (and when) the downside risk of partial capital recovery becomes more likely.</p>	<p>This proposed change is discussed in Chapter 3: Risk of partial capital recovery.</p>
<p>We propose to amend the IMs to lower the revenue materiality threshold for EDBs or GPBs deciding the cost allocation approach from the current 20% to 10%. The objective is to ensure that when EDBs or GPBs use the avoidable cost allocation methodology (ACAM), this does not result in increases to regulated revenue greater than 1-2%, compared to the use of the accounting-based allocation approach (ABAA).</p>	<p>This proposed change would continue to maintain incentives on suppliers to promote efficiencies through diversification in other regulated and unregulated services (consistent with s 52A(1)(b) and 52T(3)), while at the same time better ensuring that the benefit of those efficiency gains are shared with consumers of regulated services (consistent with s 52A(1)(c)).</p>	<p>This proposed change is discussed in Chapter 4: Regulatory treatment of revenues and costs from emerging technology.</p>
<p>We propose to strengthen the requirement in the IMs to make it clear that the use of proxy cost allocators must be justified when applying ABAA. We also propose to require additional information under information disclosure about why suppliers could not use a causal allocator and why their selected proxy allocator is appropriate.</p>	<p>This proposed change will put greater onus on suppliers to better demonstrate that:</p> <ul style="list-style-type: none"> • a causal relationship cannot be established; and • the proxy cost allocator selected is appropriate. <p>We consider this would better give effect to our original intent of the application of the ABAA approach by ensuring that the flexibility to use proxy rather than causal allocators is only used where no causal approach is suitable.</p> <p>The additional information required under information disclosure will help us assess whether the requirements need to be further tightened in future.</p>	<p>This proposed change is discussed in Chapter 4: Regulatory treatment of revenues and costs from emerging technology.</p>

X14. This topic paper forms part of our package of draft decisions papers on the IM review. As part of the package of papers, we have also published:

X14.1 a summary paper of our draft decisions;

X14.2 an introduction and process paper which provides an explanation of how the papers in our draft decisions package fit together; and

X14.3 a framework paper which explains the framework we have applied in reaching our draft decisions on the IM review.

Invitation to make submissions

X15. We invite submissions on this paper by **5pm on 28 July 2016**. We then invite cross submissions by **5pm on 11 August 2016**.

X16. Please address submissions and cross submissions to:

Keston Ruxton
Manager, Input Methodologies Review
Regulation Branch
im.review@comcom.govt.nz

X17. Please clearly indicate within your submission which aspects of this paper it relates to.

Chapter 1: Introduction

Purpose of this paper

1. The purpose of this paper is to:
 - 1.1 summarise our understanding of the changing energy landscape, the Commission's role as economic regulator in that context, and the impacts of that emerging technology on the input methodologies (**IMs**);
 - 1.2 explain in relation to the emerging technology topic:
 - 1.2.1 the problems we have identified within this topic area;
 - 1.2.2 our proposed solutions to these problems; and
 - 1.2.3 the reasons for our proposed solutions; and
 - 1.3 explain how we have taken stakeholders' submissions into account in considering the above, in identifying problems for the IM review, and in reaching our proposed solutions to problems identified within this topic.

Where this paper fits in to our package of draft decisions papers

2. This topic paper forms part of our package of draft decision papers on the IM review. For an overview of the package of papers and an explanation of how they fit together, see the Introduction and process paper published as part of our draft decision package.¹
3. This paper explains our proposed solutions to problems identified within the topic of emerging technology.
4. To the extent our proposed solutions involve changes to the IMs, this paper identifies how we propose to change our existing IM decisions to account for our proposed solutions to problems within this topic area.² The report on the IM review then collates our proposed changes to the existing IM decisions.³
5. Our proposed drafting changes to the IMs, including any resulting from this topic area, are shown in the draft determinations, which we expect to publish on 22 June 2016.

¹ Commerce Commission "Input methodologies review draft decisions: Introduction and process paper" (16 June 2016).

² To the extent our proposed solutions lie outside (or partially outside) of the IMs, we also identify other regulatory instruments or tools that might be affected (eg, information disclosure or price-quality determinations, or guidance notes).

³ We expect to publish the Report on the review on 22 June 2016.

6. The framework we have applied in reaching our draft decisions on the IM review is set out in a separate paper, published alongside this paper.⁴ The framework paper explains that we have only proposed changing the current IMs where this appears likely to:
 - 6.1 promote the Part 4 purpose in s 52A more effectively;
 - 6.2 promote the IM purpose in s 52R more effectively (without detrimentally affecting the promotion of the s 52A purpose); or
 - 6.3 significantly reduce compliance costs, other regulatory costs, or complexity (without detrimentally affecting the promotion of the s 52A purpose).
7. The framework paper also describes key economic principles that can provide guidance as to how we might best promote the Part 4 purpose.

Structure of this paper

8. The first chapter of this paper provides an overview of the changing energy landscape, including:
 - 8.1 why the landscape is relevant for the IM review;
 - 8.2 what is changing and what is not;
 - 8.3 our role as economic regulator; and
 - 8.4 the role of the IMs in the emerging technology context.
9. The two remaining chapters in this paper address the two key problem areas within the emerging technologies topic that we consider need addressing through changes to the IMs:
 - 9.1 the risk that a significant number of consumers disconnect from electricity networks (referred to as ‘the risk of partial capital recovery’); and
 - 9.2 the regulatory treatment of revenues and costs from emerging technology.
10. Each of those chapters describes the problems we have identified and our proposed solution(s), and explains how we have taken stakeholders’ submissions into account in shaping our problem definitions and our proposed solutions.
11. We also include two attachments to the paper:
 - 11.1 Attachment A contains analysis on whether the risk of partial capital recovery is likely to be a significant concern in the short term; and

⁴ Commerce Commission “Input methodologies review draft decisions: Framework for the IM review” (16 June 2016).

- 11.2 Attachment B contains analysis supporting the proposed change to the cost allocation IM materiality thresholds discussed in Chapter 4.

Introduction to this topic

12. In our problem definition paper,⁵ we described our initial views on the future impact of emerging technologies in the energy sector topic.
13. The emerging technologies topic is about the evolving nature of the energy system, and the potential impacts on electricity and gas networks. The combination of new technologies, business models, and consumer behaviours may lead to significant changes in how the electricity and/or gas systems are managed. This may in turn suggest that changes are required in how they (or parts thereof) are regulated.
14. The potential problem areas we have considered within this topic are as follows:⁶
- 14.1 risk of partial capital recovery – increasing deployment of emerging technologies potentially changes the risk to suppliers’ ability to fully recover their invested capital;
 - 14.2 regulatory treatment of revenues and costs from emerging technologies (including cost allocation):
 - 14.2.1 revenue materiality threshold – the application of this threshold is no longer delivering the policy intent of the cost allocation IM as well as it could, when applied by some suppliers; and
 - 14.2.2 use of proxy cost allocators – suppliers can have an incentive to allocate as much cost as possible to the regulated service, which means that the regulated service may bear a greater proportion of costs than it should; and
 - 14.3 efficient investment incentives:
 - 14.3.1 the benefits of investment in emerging technologies may not accrue until future regulatory periods;
 - 14.3.2 the benefits of investment in some emerging technologies are split along the value chain, which may result in under-investment; and
 - 14.3.3 incentives to innovate may need to be stronger.

⁵ Commerce Commission “Input methodologies review invitation to contribute to problem definition” (16 June 2015).

⁶ As we discuss in the following chapters, we consider that some of these amount to problems, while others do not.

Who do the proposed solutions described within this paper apply to?

15. All of the proposed solutions and changes to the IMs described within this paper apply to electricity distribution businesses (**EDBs**).
16. This paper may also be of particular interest to:⁷
 - 16.1 Gas pipeline businesses (**GPBs**) as we propose that the changes to the cost allocation IM presented in Chapter 4 (Regulatory treatment of revenues and costs from emerging technologies) would also apply to them.
 - 16.2 Gas distribution businesses (**GDBs**) who may consider they face an increased risk of partial capital recovery, although potentially for different reasons than EDBs (discussed in Chapter 3 – Partial capital recovery).
 - 16.3 Electricity retailers who raised concerns about ensuring there is a ‘level playing field’ between regulated and non-regulated markets. Chapter 4 (Regulatory treatment of revenues and costs from emerging technologies) discusses this issue.
 - 16.4 Other parties interested in emerging technologies, such as Transpower, gas transmission businesses, and consumer groups.

Invitation to make submissions

17. We invite submissions on this paper by **5pm on 28 July 2016**. We then invite cross submissions by **5pm on 11 August 2016**.
18. Please address submissions and cross submissions to:

Keston Ruxton
 Manager, Input Methodologies Review
 Regulation Branch
im.review@comcom.govt.nz
19. Please clearly indicate within your submission which aspects of this paper it relates to.
20. The Introduction and process paper contains further details about the submissions process. This includes:⁸
 - 20.1 explaining that material provided outside of the indicated timeframes without an extension might not be considered in reaching our final decisions;

⁷ This list is not exhaustive. Rather it is intended to provide some guidance to readers about parts of this paper that might be of particular interest to them.

⁸ Commerce Commission “Input methodologies review draft decisions: Introduction and process paper” (16 June 2016), chapter 5.

- 20.2 providing guidance on requesting an extension to the submission timeframes;
- 20.3 noting that we prefer submissions on our draft decisions in a file format suitable for word processing, rather than the PDF file format; and
- 20.4 providing guidance on making confidential submissions.

Chapter 2: The changing energy landscape

Purpose of this chapter

21. This chapter provides the context for the specific problems we identified in this topic area and our proposed solutions in response to those problems. Since stakeholders engaged in business or as consumers are best placed to understand their business and interests, we draw heavily on the points they have raised during the IM review process to date. Further, our relative expertise is in economic regulation, not predicting the precise impact of developing and future technologies, and we seek the perspective of others on how the electricity distribution network of the future will differ from today's.

Structure of this chapter

22. The chapter begins with an overview of the market environment within which we apply the IMs. It describes how that environment is changing, and sets out our role as an economic regulator. It then goes on to outline the role of the IMs in the context of emerging technologies, and our key areas of focus for the IM review. It concludes by responding to concerns raised by some submitters about the incentives for EDBs to invest in emerging technologies.

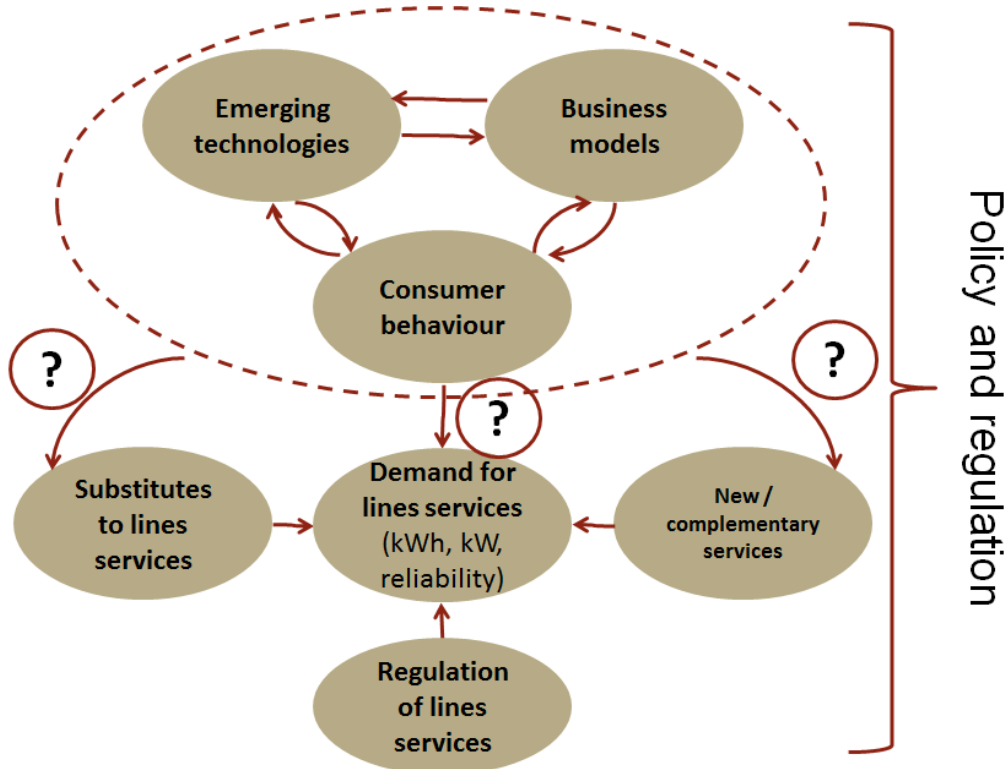
Why is the landscape relevant for the IM review?

23. In reviewing the IMs, it is important to consider the wider environment within which we apply them, as the rules were not created and are not applied in a vacuum.
24. There is an exciting range of developing and emerging technologies which have the potential to shape the electricity networks of tomorrow. These technologies, variously described as emerging, evolving, developing, or edge technologies, include, for example, distributed and grid electricity storage, distributed electricity generation including solar photovoltaic (**PV**) and wind, electric vehicles, and home automation systems. Their broad deployment will contribute to the evolution towards a smart grid.⁹ These developing technologies will enable new business models, and seem destined to enjoy consumer acceptance both by giving consumers greater options and choice over how they use energy (and how much) and as they facilitate continued global moves to greater use of renewable energy.
25. These technologies, business models, and consumer behaviours are interrelated with policy and regulations that affect market structure (eg, separation between electricity generation/retailing, distribution/transmission and other energy-related services), conduct (eg, pricing and investing), and performance (eg, profitability).

⁹ MBIE's Smart Grid Forum defines Smart Grid as follows: "A Smart Grid is an electricity network that can intelligently integrate the actions of all users connected to it – generators, consumers and those that do both – in order to efficiently deliver sustainable, economic and secure electricity supplies". See: Smart Grid Forum "Architecting a future electricity system for all New Zealanders" (April 2014), p. 1. Available at: <http://www.mbie.govt.nz/info-services/sectors-industries/energy/electricity-market/nz-smart-grid-forum/meeting-1/final-tor-scope-definition.pdf/view>.

26. We show a possible depiction of some of these interrelationships as they affect EDBs in Figure 1:

Figure 1: Some key interrelationships in the electricity sector



Note: arrows represent direction of influence.

27. As Figure 1 shows, there is currently some uncertainty regarding the future role of and demand for electricity lines services, which is the service that Parliament has defined and mandated that should be regulated. A key driver for this uncertainty is that the ‘trio’ of emerging technologies, new business models, and changing consumer behaviour has the potential to create viable substitutes to lines services, or at least erode their natural monopoly characteristics.¹⁰ At the same time, as a result of the same ‘trio’, the electricity distribution network has the potential to provide increasing value to consumers who remain connected to it by enabling the delivery of new or complementary services.¹¹

¹⁰ For example, the Rocky Mountain Institute noted “...what happens when solar and battery technologies are brought together? Together they can make the electric grid optional for many customers—without compromising reliability and increasingly at prices cheaper than utility retail electricity”. See: Rocky Mountain Institute “The economics of grid defection: When and where distributed solar generation plus storage competes with traditional utility service” (February 2014), p. 1. Available at: http://www.rmi.org/electricity_grid_defection.

¹¹ For example, p2power is a retailer that allows for peer to peer trading of electricity. See: www.p2power.co.nz.

28. Several stakeholders recognised the various interrelationships between the different regulatory agencies and the wider environment within which we apply the IMs. For example:

28.1 Orion submitted:

Changes to the IMs in relation to emerging technologies should be co-ordinated with the Electricity Authority and the Ministry of Business, Innovation and Employment as they hold some other relevant policy levers (e.g. pricing methodologies, low-user fixed charge regulation). It is necessary to ensure the policy/regulatory directions are consistent.¹²

28.2 Vector submitted:

Vector recognises that, to some extent, the issues raised by the emergence of a new operating environment go beyond the current review of IMs. For example, as technology that enables customers to remain energised during an outage is more widely integrated, the measures the Commission uses for quality and reliability will need to be reviewed.

These changes in the sector raise important questions of over-arching regulatory policy, and will need to be addressed in an appropriate forum. That said, we consider that there are a number of ways in which regulation under Part 4, and the IMs in particular, can be better attuned to the new market environment suppliers are now faced with.¹³

What is changing; what is not?

29. There is a wide range of views about the evolving nature of the energy system and the potential impacts on electricity and gas networks.
30. What is not changing is our purpose, which is to promote the long-term benefit of consumers of regulated services (electricity lines and gas pipelines in this context). We will continue to do so within our current (and any future) statutory remit regardless of the changing environment.
31. However, the changing environment does influence how, within the ‘tools and levers’ at our disposal, we pursue our purpose. For example, where the environment becomes more uncertain, we look to maintain or enhance the flexibility that the IMs give businesses to respond and adapt (eg, maintaining three complementary cost allocation approaches). Where the issues cut across government agencies and regulators, we look to collaborate with them to achieve the best outcome for consumers (eg, our collaboration with the Electricity Authority on assessing the impact of emerging technologies and the form of regulatory control on distribution pricing).

¹² Orion's submission on the problem definition paper “Submission on the IM review” (21 August 2015), para 39.

¹³ Vector's submission “Input methodologies review – Invitation to contribute to problem definition” (21 August 2015), p. 11.

32. The prevailing consensus appears to be that the New Zealand electricity grid will continue to be needed and used by most consumers to satisfy their various energy requirements. However, the way those consumers use the grid, and in particular the distribution network, will evolve and change. At the outset of our IM review process, representatives from the Smart Grid Forum presented to a wide range of stakeholders at our IM forum on their work to date on emerging smart grid technology on the energy sector. Those representatives noted that the distribution network of the future will need:¹⁴
- 32.1 to be consumer centric – providing energy choices and options to consumers;
 - 32.2 to facilitate customer and third party transactions (open access), supplementing locally generated electricity, and providing supply reliability and resilience; and
 - 32.3 the network operator to ensure:
 - 32.3.1 the safe and reliable operation of the network;
 - 32.3.2 systems stability, power quality and adequacy of supply; and
 - 32.3.3 the integrity of network assets.
33. So what in the environment is changing? Below we present a selection of stakeholder views.

Stakeholders' views vary widely

34. Most stakeholders agree that the key changes to be considered in undertaking the IM review are new and improved technologies, innovative business models, and changing consumer needs and behaviour.
- 34.1 In its presentation to our stakeholder forum, the Smart Grid Forum identified four key changes for the providers of electricity lines services.¹⁵
 - 34.1.1 uncertainty over future demand patterns with credible scenarios for increased and decreased use, two-directional power flows, and demand potentially becoming more intermittent and peaky;
 - 34.1.2 system instability from variable generation, leading to power quality issues, and potential frequency excursions;

¹⁴ Smart Grid Forum, "The future impact of emerging technologies in the energy sector", Commerce Commission IM review Conference, 29 July 2015. A presentation by Paul Atkins, John Hancock, and Ryno Verster.

¹⁵ Smart Grid Forum, "The future impact of emerging technologies in the energy sector", Commerce Commission IM review Conference, 29 July 2015. A presentation by Paul Atkins, John Hancock, and Ryno Verster.

34.1.3 competing network requirements with greatly varying uptake rates for new technology, but safety and reliability remaining paramount; and

34.1.4 a need to better understand consumers and the differences between consumers.¹⁶

34.2 New Zealand Institute of Economic Research (**NZIER**) described these changes in its report to the Major Energy Users' Group (**MEUG**):

When the IMs were being developed prior to 2010, there was little prospect of the electricity industry being subject to the sorts of disruptive changes that are starting to emerge. The potential for change was talked about but the IMs were developed in an energy system where, for instance, nearly all electricity was generated far from the point of use, transported by the grids and offered for sale and purchased in the wholesale market.

This has now changed and will continue to do so, requiring a re-consideration of the risks and incentives for both networks businesses and for consumers of network services.

Declining demand growth for energy, climate change concerns, strong growth of renewable local generation of electricity, energy storage systems and demand management, as well as the use of smart technology in the operational management of grids have all combined to jump start what is now regarded as potentially the most profound changes to the energy industries since the initial development of the networks.¹⁷

34.3 Vector described the changes as follows:

The current electricity distribution IMs were designed for a traditional market environment.

That market environment could be fairly characterised as:

- having little customer choice;
- stable, with predictable, incrementally increasing demand and very limited risk of significant change in operating conditions;
- continuous, with historical investment supporting the current provision of services; and
- consistent, with different geographical regions facing similar conditions (albeit with slightly different cost structures, demand profiles and density).

The conventional energy distribution business model is a product of this particular market environment. A stable, continuous and predictable market environment promotes a relatively high prospect of cost recovery that provides the appropriate incentives to undertake the types of large, sunk investment required in traditional energy markets.

¹⁶ We note that many of these changes are outside the scope of the IMs, and this review of the IMs.

¹⁷ NZIER's submission on the problem definition paper "Commission review of the IM's identifying problems with current IM's" (report prepared for MEUG, 21 August 2015), p. 7.

The market changes that Vector and other suppliers are now observing and experiencing suggests a move towards a very different market environment from the one in respect of which IMs were expected to apply.¹⁸

35. Some stakeholders consider emerging technology could have a significant impact on the electricity industry. For example:

35.1 Solarcity submitted:

Change is coming to the electricity sector that is so significant it will make the creation of the electricity market look like re-arranging the deck chairs” That is the view expressed by the former head of Meridian Energy, Keith Turner, in an address to the energy industry leaders, August 2015. The changes, driven by reducing costs of solar, batteries, electronic control systems, clean technology, energy efficient appliances and information systems will “turn the industry on its head.”¹⁹

35.2 Vector submitted:

Market change has been characterised as ‘unconventional’ and ‘disruptive’ because of the challenge it presents to suppliers’ prevailing business models. Competition from new alternatives is affecting all levels of the value chain and components that were previously seen as complementary are now competing to secure a greater share of the value offered to consumers. It will become increasingly difficult to determine where energy solutions chosen by customers fit within the traditional boundaries of generator / grid operator / distributor / retailer. This is a remarkable change for a previously stable, segmented sector of the economy.²⁰

35.3 John Irving considered that:

... world-wide a paradigm change in the power sector is taking place and inevitably it will also develop in the NZ power market.²¹

36. Other stakeholders considered that the impacts of emerging technology will be less material and that distribution networks will continue to provide benefits to consumers in the future. For example:

36.1 Orion submitted:

Our view is that the network will continue to be needed and valued by the overwhelming majority of consumers for the foreseeable future. We therefore consider the risk of asset stranding to be low, although acknowledge that utilisation patterns may change.²²

¹⁸ Vector's submission “Input methodologies review – Invitation to contribute to problem definition” (21 August 2015), p. 4.

¹⁹ Solarcity's submission on the problem definition paper “Submission to Commerce Commission – Discussion paper on input methodology review” (21 August 2015), p. 2.

²⁰ Vector's submission “Input methodologies review – Invitation to contribute to problem definition” (21 August 2015), p. 7.

²¹ John Irving's submission on the problem definition paper “Topic 4: The future impact of emerging technologies in the energy sector” (13 July 2015), p. 1.

36.2 Sustainable Electricity Association of New Zealand (**SEANZ**) submitted:

An appropriate market regime which operates at the local level will promote the long term benefit of consumers only if they are induced/incentivised to remain connected. This should be a long term focus of any regulatory action.²³

36.3 Electricity Networks Association (**ENA**) submitted:

Recent innovations and technological breakthroughs in terms of producing solar PV, batteries, electric vehicles, etc. at ever lower costs is likely to drive significant change in the electricity sector. We currently see only a low risk that there will be widespread disconnection from the electricity network. However, patterns of use are likely to change and this will bring new challenges for ENBs [Electricity Network Businesses] to manage.²⁴

37. Some stakeholders consider that the benefits of technology-driven changes are significant, and there should be incentives for parties to adapt sooner rather than later. For example:

37.1 John Irving noted:

It is also evident that technologically driven changes in the energy/power sector will have benefits in (a) supporting Gov'ts initiatives to meet new Climate Change targets, (b) attracting private sector investment (i.e. by consumers for PV systems and batteries) into the energy market; (c) reducing the need for imported fossil fuels for transport - by supporting the greater use of electric vehicles and concurrent development of V2G technologies; and (d) increasing competition to help drive down electricity charges.²⁵

37.2 SEANZ submitted:

To address the impact of these new consumer-led technologies, regulatory change is needed to meet [the] IM objective of promoting the long term benefit for consumers. To provide a framework to guide future energy investments (either by the consumer or the supply industry, these issues must be addressed now.²⁶

²² Orion's submission on the problem definition paper "Submission on the IM review" (21 August 2015), para 41.

²³ SEANZ's submission "Re: Input methodologies review – Problem definition" (21 August 2015), p. 4.

²⁴ ENA's submission on the problem definition paper "Response to the Commerce Commission's input methodologies review paper" (21 August 2015), p. 23.

²⁵ John Irving's submission on the problem definition paper "Topic 4: The future impact of emerging technologies in the energy sector" (13 July 2015), p. 1.

²⁶ SEANZ's submission "Re: Input methodologies review – Problem definition" (21 August 2015), p. 4.

38. Some consider the impact is imminent. For example:

38.1 SEANZ submitted:

The prevalent view is that these consumer-led technologies represent massive imminent disruption to the existing supply industry business models.²⁷

38.2 Vector noted:

The Commission's characterisation of this emerging market as "future impact" risks creating a perception that a more competitive market is a speculative issue. Rapid change is occurring in the market now.²⁸

39. Other stakeholders note there is significant uncertainty over the timing of extensive emerging technologies deployment and advised against making substantial amendments to the IMs as part of this IM review.

39.1 Orion submitted:

We agree it is worth including this topic in the review but are not yet convinced that the IMs need to change materially in response to emerging technologies. There may be some smaller adjustments that could be helpful.²⁹

39.2 Powerco considered:

We agree that emerging technologies have the capacity to dramatically alter the commercial landscape for EDBs. This may require consequential amendments to the IMs. However, the nature of the likely implications of new technologies for the market, and the timing of those developments, is currently unclear. Consequently, while it is appropriate for the Commission to consider these issues, we think it will prove inadvisable to make any substantial amendments, in response to changing technologies, as part of this IM review cycle.³⁰

39.3 The Smart Grid Forum submitted:

At this point there is no clear problem that would justify changing the existing regulatory governance structure. Indeed, in the domain of fast-changing technology a market-led approach, relying on market participants and customers to choose if and when to invest is likely to be the most dynamically efficient.³¹

²⁷ SEANZ's submission "Re: Input methodologies review – Problem definition" (21 August 2015), p. 3.

²⁸ Vector's submission "Input methodologies review – Invitation to contribute to problem definition" (21 August 2015), p. 2.

²⁹ Orion's submission on the problem definition paper "Submission on the IM review" (21 August 2015), para 38.

³⁰ Powerco "Submission on input methodologies review: Invitation to contribute to problem definition" (21 August 2015), p. 4.

³¹ Smart Grid Forum's submission "Input methodologies review – Invitation to contribute to problem definition" (18 July 2015), p. 2.

The Commission's perspective

40. A key task we have faced has been to determine what in the changing environment has the potential to majorly impact the consumers of the regulated service.
41. The two key areas we identified are:
 - 41.1 demand for electricity lines services: the extent to which consumers of electricity and gas need and want the grid now and in the future given the relative value/cost proposition of the alternatives, and what that means for whether and/or how we regulate EDBs. We discuss this area in Chapter 3 where we deal with the risk of partial capital recovery for investors in existing infrastructure; and
 - 41.2 incentives on suppliers of electricity lines services: ensuring the current monopoly providers of these services have incentives to respond efficiently to the changing environment (eg, adopt new technologies or re-orient their business model), so their consumers benefit from the developments described above. We discuss this area in the last section of this chapter and also in Chapter 4, where we deal with the regulatory treatment of some emerging technologies.
42. As mentioned above, although some aspects of the environment in which the IMs were set are changing, our purpose remains the same.
43. We discuss this in more detail below.

Our role as economic regulator

44. As mentioned, our purpose is to promote the long-term benefit of consumers of the regulated service. To fulfil this, we identified the following two related areas of work.
 - 44.1 Increasing our knowledge and understanding of ongoing and potential emerging technology-related developments. This is important in order to ensure our review of the IMs is done with an adequate contextual understanding, in order to ensure their effectiveness today and in the short-to-medium term.
 - 44.2 Encouraging open debate and disseminating knowledge to inform discussions. This is important, not only to ensure that we had a good understanding, but also to promote a shared level of stakeholder understanding, including on how we approach the issues as regulator. We consider that this encourages suppliers to more actively consider how emerging technology-related developments can affect their businesses, and to more efficiently respond.
45. In order to progress the above areas, we purposefully kept the scope of our review wide. This was in recognition that the nature of the issues affects many stakeholders along the energy value chain, including other government agencies.

46. In 2015 we published two papers,³² held an open forum,³³ and an industry workshop.³⁴ We also engaged publicly and bilaterally with several key stakeholders, including the Electricity Authority, Ministry of Business, Innovation and Employment (MBIE), Treasury and the Smart Grid Forum.³⁵
47. We have found that the process so far has been valuable and consider that we have made good progress in the two areas.
- 47.1 On the understanding front, we have comfort that the IM decisions explained in Chapters 3 and 4 have been made with an adequate understanding of the current and future context in which the relevant IMs will be applied.
- 47.2 We have been pleased with the widespread level of engagement in our process, particularly from stakeholders who we do not directly regulate, but who have an interest in this space (eg, Electricity Retailers' Association of New Zealand (ERANZ),³⁶ SEANZ,³⁷ John Irving,³⁸ Molly Melhuish,³⁹ Bryan Leyland,⁴⁰ among others). Their different points of view have enriched the debate. We are also encouraged to see some EDBs taking concrete actions to better understand and respond to the changing environment.⁴¹

³² Commerce Commission "Input methodologies review invitation to contribute to problem definition" (16 June 2015) and Commerce Commission "Input methodologies review – Emerging technology pre-workshop paper" (30 November 2015).

³³ See: <http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/input-methodologies-review/input-methodologies-review-forum-2/>.

³⁴ See: <http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/input-methodologies-review/emerging-technology/>.

³⁵ Commerce Commission's Downstream 2016 presentation "Regulation and the future impact of emerging technologies" (3 March 2016); Letter from Carl Hansen (Chief Executive, Electricity Authority) to Sue Begg (Deputy Chair, Commerce Commission) on implications of regulatory treatment of cash flows for emerging technology (1 June 2016).

³⁶ ERANZ "Submission on emerging technologies – Workshop and pre-workshop paper" (4 February 2016).

³⁷ SEANZ's submission "Re: Input methodologies review – Problem definition" (21 August 2015), and SEANZ's cross submission on the problem definition paper "SEANZ cross submission on the IM for the electricity sector" (8 September 2015).

³⁸ John Irving's submission on the problem definition paper "Topic 4: The future impact of emerging technologies in the energy sector" (13 July 2015).

³⁹ For example, Molly Melhuish's submission "Input methodologies review, invitation to contribute to problem definition" (24 August 2015), and Molly Melhuish's cross submission on the problem definition paper "Cross-submission input methodologies review" (4 September 2015).

⁴⁰ Bryan Leyland "Submission on problem definition – Topic 4: The future impact of emerging technologies in the energy sector (Rev A)" (21 August 2015).

⁴¹ For example, Alpine Energy's grid-scale battery storage trial (see: http://infratec.nz/index.php?option=com_content&view=article&id=89:alpine-energy-to-explore-new-technology-opportunities&catid=35&Itemid=644); Counties Power's grid-scale battery storage trial (see page 168 at: <http://www.countiespower.com/vdb/document/56>), and Vector, who has forged a relationship with Tesla Energy to bring its Powerwall battery to NZ (see: <https://vector.co.nz/tesla-energy?sessionid=667526C0D48D00A296A227E23D2AAA0A>).

48. We find useful to emphasise the following two key points from the process to date.
- 48.1 What we regulate: we regulate services, not assets or technologies. In the case of electricity, we regulate electricity lines services as defined by Parliament. We only regulate companies in as much as they are involved in delivering the regulated service. As a result, we are technology agnostic in the way we regulate electricity lines services, but recognise that new technologies may change the way in which suppliers deliver electricity lines services. Our rules seek to ensure consumers of electricity lines services benefit from these changes.
- 48.2 Areas out of scope: some emerging technology-driven changes are in areas outside the scope of the IMs. Some span across existing industry segments, others do it across regulators. The key ones include:
- 48.2.1 Distribution pricing: EDB changes to their prices as they respond and adapt to increasing deployment of emerging technologies. Distribution pricing falls mainly within the remit of the Electricity Authority, although the form of control we impose on EDBs plays a role in influencing EDB pricing decisions;
- 48.2.2 Market structure: new technologies have the potential to be simultaneously valuable for the delivery of regulated and unregulated services. For example, electricity storage technology can help EDBs deliver electricity lines services, and at the same time be used to provide unregulated services. This situation raises important questions on the existence and functioning of markets associated with the regulated service and the unregulated ones. For example, should demand response that helps deliver electricity lines services at the distribution level be delivered via a market, and should EDBs be allowed to participate in it, and on what terms? The Electricity Authority, via the Electricity Industry Act 2010, has some ability to decide over these matters.⁴² Parliament has ultimate decision-making power should more fundamental changes to industry structure be deemed appropriate;

⁴² Letter from Carl Hansen (Chief Executive, Electricity Authority) to Sue Begg (Deputy Chair, Commerce Commission) on implications of regulatory treatment of cash flows for emerging technology (1 June 2016).

48.2.3 Boundaries of regulation and competition: more fundamentally, if new technologies erode the natural monopolistic characteristics of electricity lines services (or gas pipeline services),⁴³ then policy makers (Parliament) will have to revisit what aspects, if any, require continued economic regulation, and potentially amend legislation. For the avoidance of doubt, while our IM review was not aimed at answering this question, we have not found evidence to suggest that electricity lines services no longer have natural monopoly characteristics, now or probably in the medium term.

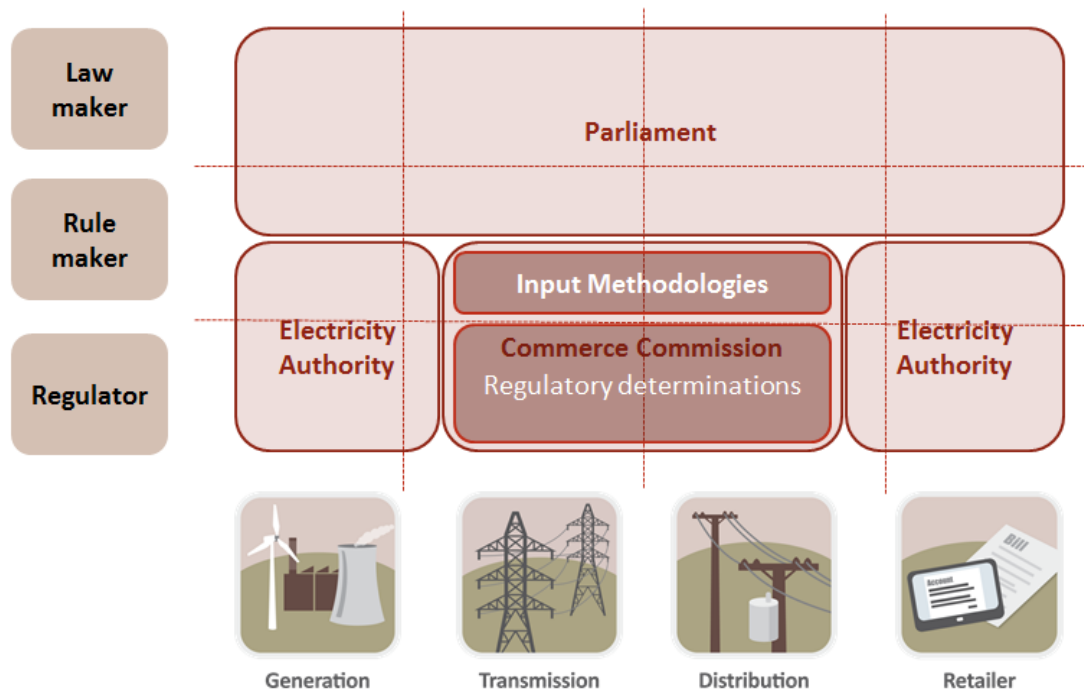
49. The Electricity Authority promotes competition in, reliable supply by, and the efficient operation of, the New Zealand electricity industry for the long-term benefit of consumers.⁴⁴ It does this through market design, overseeing market operations, and monitoring and enforcing compliance with market rules.⁴⁵
50. The above highlights the renewed importance of collaboration between regulators and policy makers to ensure the long-term benefit of consumers is promoted in these times of change.
51. Figure 2 provides an overview of the roles and areas of responsibilities of the regulators and policy makers in the electricity industry and sets the regulatory context for emerging technologies and the IM review.

⁴³ We note that Australia's National Competition Council recently determined that that "light regulation" (ie, based on information disclosure and negotiate arbitrate arrangements) be applied to the services provided by Queensland Gas Distribution Network (QGDN). While considering that QGDN enjoys, and will continue to enjoy, market power, the Council acknowledged the precarious competitive position of gas in the areas served by QGDN and noted that the ability of end users to substitute to other forms of energy (electricity and LPG) acts as a constraint on QGDN's market power. See: <http://ncc.gov.au/images/uploads/LRQGDNFD-001.pdf>.

⁴⁴ See: <http://www.ea.govt.nz/>.

⁴⁵ See: <http://www.comcom.govt.nz/dmsdocument/9673>.

Figure 2: The regulatory context for input methodologies in the electricity sector



The role of the IMs in the emerging technology context

52. The role of the IMs in the context of emerging technology is to ensure they provide an appropriate balance of incentives which facilitates efficient industry response, benefiting consumers in the long term.
53. In considering changes to the IMs, we also want to future proof them to the extent possible, given the information available to us today.
54. However, the IMs are only one part of our regulatory toolkit. We also have a monitoring and influencing role through our information disclosure requirements and through our summary and analysis of publicly disclosed information. This aspect of our work can have a valuable role to play, for example by identifying and disseminating good practice, socialising learnings from emerging technology trials, and informing ongoing debates.
55. Regarding the relatively narrow remit of the IMs, we have identified the following key areas of focus for the IM review:
 - 55.1 risk of partial capital recovery (Chapter 3);
 - 55.2 regulatory treatment of revenues and costs associated with emerging technology (Chapter 4); and
 - 55.3 efficient investment incentives (discussed below).

56. Chapter 4 starts by setting out the problems we have identified and our proposed solutions to these problems. Other relevant issues raised by stakeholders, in particular the concerns raised by electricity retailers and the Electricity Authority about the participating of EDBs in related competitive markets, and our perspectives on these issues, are included in the second half of the chapter.

Efficient investment incentives

57. Regarding incentives for EDBs to efficiently invest in emerging technologies, submitters raised the following three issues:
- 57.1 that the benefits of investment in emerging technologies may not accrue until future regulatory periods;
 - 57.2 that the benefits of investment in some emerging technologies are split along the value chain, which may result in under-investment; and
 - 57.3 that incentives to innovate may need to be stronger.

The benefits of investment in emerging technologies may not accrue until future regulatory periods

58. This concern is that EDBs may not make certain investments (eg, related to smart grid, demand-side management, energy efficiency) that are in the long-term interest of consumers.⁴⁶ This is because the benefits to the EDB (and eventually consumers) of such investments, in the form of lower future costs, only materialise in future regulatory periods, while the costs happen up-front. The concern is that EDBs would be penalised for incurring those costs now, and not be able to recoup the benefits in future periods.
59. We generally plan to set an efficient expenditure allowance, which should be adequate on average. We expect EDBs to make trade-offs on the timing of expenditure within that allowance. We consider that there is no reason to assume that EDBs would not earn at least a normal return on their efficient expenditure allowance during the regulatory period. Investments made during the regulatory period, even if greater than the allowance, are added to the regulatory asset base (**RAB**) and start earning the weighted average cost of capital (**WACC**) from subsequent regulatory periods.

⁴⁶ This concern was raised in a number of submissions, including: Unison "Submission on input methodologies review invitation to contribute to problem definition" (24 August 2015), para 7 b); ENA's submission on the problem definition paper "Response to the Commerce Commission's input methodologies review paper" (21 August 2015), para 144; Orion's submission on the problem definition paper "Submission on the IM review" (21 August 2015), para 49; and PwC "Submission to the Commerce Commission on input methodologies review: Invitation to contribute to problem definition (21 August 2015), para 101.

The benefits of investment in emerging technologies are split along the value chain

60. This concern is that EDBs may not make certain investments that are in the long-term interest of consumers.⁴⁷ This is because the costs fall on one party (the EDB in this case) while the benefits are shared with additional parties along the value chain. To the extent that the costs to the party investing exceed the benefits this party is able to capture, it will not invest, even though the overall benefits may outweigh the costs.
61. We acknowledge that there may be transaction costs associated with coordination and contracting between parties. This is to be expected given the vertically separated structure of the industry. However, if the total benefits of the investment outweigh the total costs, we would expect it to go ahead. We are not convinced this issue warrants regulatory intervention via the IMs. There may be a case for regulatory intervention if the existence of a market failure can be demonstrated. The case would also have to be made that the IMs are the best regulatory tool for the intervention.⁴⁸

Incentives to innovate should be stronger

62. Several submitters suggested that the IMs should include specific incentives for EDBs to invest in research and development in relation to emerging technologies.⁴⁹
63. Some also noted that there is a natural incentive for EDBs to favour investment in known technologies.⁵⁰
64. The Smart Grid Forum submitted “the IMs must mimic the competitive market where companies offset the costs of a failed technology pilot or trial against the benefits of successful pilots put into production”.⁵¹

⁴⁷ Orion's submission on the problem definition paper “Submission on the IM review” (21 August 2015), para 40; Smart Grid Forum's submission “Input methodologies review – Invitation to contribute to problem definition” (18 July 2015), pages 6-7.

⁴⁸ The Smart Grid Forum discussed this coordination point in the context of ripple control investments and reached similar conclusions. See item 9 at: http://www.mbie.govt.nz/info-services/sectors-industries/energy/electricity-market/nz-smart-grid-forum/meeting-4/minutes-and-actions.pdf/at_download/file.

⁴⁹ For example: Orion “Submission on emerging technology and the IM review” (4 February 2016), paras 18-19; PwC (on behalf of 19 Electricity Distribution Businesses) “Submission to the Commerce Commission on input methodologies review: Emerging technology pre-workshop paper” (4 February 2016), p. 11; and Transpower's submission “Input methodologies review – problem definition and decision-making frameworks” (21 August 2015), section 4.2.1.

⁵⁰ PwC “Submission to the Commerce Commission on input methodologies review: Invitation to contribute to problem definition (21 August 2015), p. 21, and Solarcity's submission on the problem definition paper “Submission to Commerce Commission – Discussion paper on input methodology review” (21 August 2015), p. 8.

⁵¹ Smart Grid Forum “Emerging technology pre-workshop paper” (29 January 2016), p. 4.

65. We consider that our regime places adequate incentives on EDBs to innovate.
- 65.1 Twelve of the 29 EDBs are consumer owned and are exempt from price-quality regulation. These EDBs should have a ‘natural’ incentive to innovate since they fully capture the benefits that successful innovation brings to their consumer-owners (either in the form of lower costs and prices, or higher profits, or a combination of the two).
- 65.2 The remaining 17 EDBs are subject to price-quality regulation, with 16 of them being under a DPP. Many of these are also at least partially consumer-owned. We set DPPs in a relatively low-cost way, which we partly achieve by applying less scrutiny to individual suppliers’ expenditure plans and forecasts than under a customised price-quality path (**CPP**).⁵² This, together with the rate of return uplift we allow, is intended to result in EDBs expecting to earn at least normal returns. Our approach to DPPs also allows EDBs to innovate without individual projects needing authorisation (as would be the case for large projects for Transpower under an individual price-quality path (**IPP**)). Therefore, DPPs provide EDBs with project flexibility and funding headroom to innovate. Furthermore, if the EDB is successful in innovating, and doing so results in costs being lower than expected when the DPP was set, it gets an upside in returns during the regulatory period.
66. We are not convinced further explicit innovation incentive mechanisms, funded by consumers, are likely to be in their interests. This is because evidence in New Zealand does not indicate there is a lack of incentives to innovate, so additional funding would risk being irrelevant and/or crowd out other funding sources.
67. However, we note the government does have a contestable fund for research and development (**R&D**) into which EDBs can bid to get innovation funding.⁵³ We consider that it may be inefficient to replicate the systems and processes needed to administer another funding scheme.
68. There are also likely to be opportunities for EDBs and other participants in the sector to partner or collaborate in trialling innovative ways to provide regulated services. This can reduce costs on individual EDBs and socialise any knowledge created.

⁵² The purpose of DPP/ CPP regulation is to provide a relatively low cost way of setting price-quality paths for suppliers of regulated goods and services, while allowing the opportunity for individual suppliers to have alternative price-quality paths that better meet their particular circumstances.

⁵³ See: <http://www.callaghaninnovation.govt.nz/grants>.

69. Indeed a number of EDBs are already modelling the likely investment requirements of emerging technologies and investigating, trialling, and rolling out various new technologies to improve the delivery of the regulated lines service. For example, a recent presentation to the Smart Grid Forum featured a range of EDB initiatives using emerging technologies. These are summarised below and lend support to the view that EDBs already have adequate current incentives to invest in emerging technologies.⁵⁴
- 69.1 ENA’s work on the ‘Transform’ model to understand the potential effects of credible emerging technology scenarios on New Zealand EDB investment. That work concluded that major increases in investment to accommodate emerging technologies, or expand smart network applications are unlikely to be required in the short term.
- 69.2 Modelling by Orion on the impact of emerging technologies on winter and summer sub-transmission peak loads, which noted that further sub-transmission and low voltage network investment may still be required in some contexts even under scenarios assuming relatively high penetration of solar PV, distributed storage and electric vehicles.
- 69.3 A range of initiatives by Vector including development of its electric vehicle charging network, deployment of batteries including Tesla powerpacks and smaller residential-scale batteries, and enhanced collection and use of data to better model future scenarios.
- 69.4 Unison’s three stage development of a smart grid which commenced in 2009, has seen 1,200 smart network assets installed to date, and is already realising significant benefits.
- 69.5 The benefits of WEL Network’s smart meter programme.
- 69.6 Northpower’s efforts to encourage the roll-out of electric vehicles including its own extensive electric vehicle charging network.
- 69.7 Powerco’s Basepower initiative for remote regions which has been deployed to ten sites to date.

⁵⁴ Glenn Coates, Rogan Clarke, Jaun Park and Ryno Verster, “Presentation from electricity distributors on the impact of new technologies and business models on lines businesses”, 4 May 2016, available at: <http://www.mbie.govt.nz/info-services/sectors-industries/energy/electricity-market/nz-smart-grid-forum/meeting-10/6-sgf-update-from-edbs.pdf/view>.

Chapter 3: Risk of partial capital recovery

Purpose of this chapter

70. This chapter explains the risk of partial capital recovery problem, our proposed solution in respect of this problem, and our assessment of another potential solution.

Structure of this chapter

71. This chapter begins by defining the problem for EDBs and then setting out our proposed solution in respect of this problem. It then discusses another potential solution to this problem and why we are not proposing to adopt it. Finally, the chapter discusses implications for GDBs and seeks evidence on whether there is a problem relating to risk of partial capital recovery for that sector.

Problem definition for electricity distribution businesses

72. This section explains the problem definition for EDBs, including how it evolved through comments from submissions.
73. The problem: increasing deployment of emerging technologies potentially changes the risk to EDBs' ability to fully recover their invested capital, under existing physical asset lives assumptions set out in the IMs. These new technologies enable greater deployment of distributed generation or greater distributed electricity storage. Such technologies may enable:
- 73.1 more consumers to generate and store their own electricity; and/or
- 73.2 new competitors to enter the market and bypass distributors' networks.
74. As a result, an EDB's network may be used by fewer consumers and the EDB may not be able to fully recover the costs of its historic investment from its remaining consumers. We assess the potential change in this risk relative to what it was in 2010, when we first set the IMs.
75. The current IMs allow for assets to stay in the RAB even though they have ceased to be used (ie, become physically stranded).⁵⁵ Therefore, asset stranding is not the risk under consideration. Rather, it is the risk that the network becomes economically stranded. That is, the risk is that at some future point enough consumers elect to disconnect from EDBs' networks such that the revenue EDBs are able to recover from the remaining customer base is insufficient to allow them to fully recover their historic capital investment (hence the title 'risk of partial capital recovery').⁵⁶ This is

⁵⁵ Commerce Commission "Input methodologies (electricity distribution and gas pipeline services) reasons paper" (22 December 2010), paras E11.1-E11.16.

⁵⁶ Merely reducing grid-sourced electricity consumption is necessary but probably not sufficient to significantly alter the risk, since EDBs can reform pricing to reflect the value that being connected brings to consumers (eg, reliability), and in doing so, continue to recover their invested capital.

because prices to those remaining consumers would need to rise beyond their willingness to pay given their economic alternatives (or beyond politically acceptable levels).⁵⁷

76. Therefore, partial capital recovery does not necessarily imply that the network stops being used altogether. Rather, that the revenues EDBs are able to recover do not cover their return of and on investment. If EDBs did not expect to recover their return of and on capital, it would be inconsistent with our principle of *ex-ante* financial capital maintenance (**FCM**).⁵⁸

77. Our approach to the FCM principle is explained in the framework paper:⁵⁹

To the extent the key economic principles continue to assist us to give effect to the s 52A purpose and outcomes we would not depart from them lightly. The Part 4 regime was intended to provide greater certainty over time, and we accept that wholesale rejection of principles we have consistently applied may affect this certainty. However, if the principles cease to be consistent with s 52A, or are not in a particular situation consistent with s 52A, we would be transparent with stakeholders about the fact that we could not continue to apply these principles.

Specifically, we acknowledge that there may come a time when, due to the development of emerging technologies or other circumstances, the key economic principles no longer assist us to promote the s 52A purpose and application of these principles is no longer sustainable. Over the longer term, this could be one possible outcome (although not a probable outcome, under currently available information) of the continued uptake of some emerging technologies that may act as substitutes to the regulated service. The market risk, in that context, is that if enough consumers disconnect from the network, the remaining consumers will not be willing or able to pay the prices that would be required for suppliers to achieve FCM, even if our price path remains consistent with FCM. There may also be a political risk in that if circumstances change to a sufficient extent, the government may intervene and amend or repeal Part 4. If such a ‘tipping point’ occurs, regardless of any action we might take, suppliers may not be able to achieve FCM.

78. It is not clear what that critical mass of consumer disconnections may need to be to cause economic stranding of networks. It is likely to be different for different networks, and depend on factors like the economic availability of substitutes, size of the sunk capital base relative to the number of consumers, and local political sensitivity to energy prices.

⁵⁷ See, for example, Vector's submission “Input methodologies review – Invitation to contribute to problem definition” (21 August 2015), para 42.

⁵⁸ As discussed in our framework paper, released alongside this paper, the principle of real FCM consists in us providing regulated suppliers the expectation *ex-ante* of earning their risk-adjusted cost of capital (ie, a ‘normal return’), which provides suppliers with the opportunity to preserve their financial capital in real terms over timeframes longer than a single regulatory period. However, price-quality regulation does not *guarantee* a normal return over the lifetime of a regulated supplier’s assets. See: Commerce Commission “Input methodologies review draft decisions: Framework for the IM review” (16 June 2016).

⁵⁹ Commerce Commission “Input methodologies review draft decisions: Framework for the IM review” (16 June 2016), pages 45-46.

79. This risk, which is linked to the potential for disconnections, is probably asymmetric for EDBs' regulated business.⁶⁰ This is because regulation limits EDBs' ability to grow revenue beyond forecast (especially so under a revenue cap), which constrains the upside to returns.⁶¹ For example, there is less scope for EDBs to grow electricity connections (and hence revenue) within existing households, since most already have one. This is different for GDBs, as discussed in paragraphs 99 to 103 below, where growing connections under a weighted average price cap could result in increased revenue, and potentially higher returns within the regulatory period.
80. However, while the risk of partial capital recovery may be asymmetric for EDBs' regulated business, we understand that the underlying drivers affecting this risk may be offsetting to an uncertain degree. For example:
- 80.1 on the one hand, there are the continued cost and performance improvements of distributed generation and battery storage, which may make them viable economic substitutes to electricity lines services; and
- 80.2 on the other hand, the same cost and performance improvements for batteries (both for electric vehicles and domestic electricity storage) increase the prospects of mass deployment of electric vehicles. This may make a connection to an EDB's network more valuable to consumers. Similarly, emerging technology (eg, smart grids, especially storage) allows increased asset utilisation.⁶²
81. We consider that the available evidence is inconclusive on whether the risk of partial capital recovery for EDBs regulated business has increased, and by how much. We consider that partial capital recovery is unlikely to be a significant concern in the short term, but may be an issue over the longer term. We present the main elements of the analysis that supports this conclusion in Attachment A.
82. What also seems clear to us is that the magnitude and direction of the risk (when considering both the potential downsides to the regulated business and potential upsides from EDB involvement in unregulated services) has become more uncertain compared to 2010.

⁶⁰ There may be an upside to EDB returns in unregulated services that emerge as a result of new technologies. The opportunities in unregulated businesses will arguably tend to make the risk of partial capital recovery more symmetric.

⁶¹ There are of course opportunities to grow returns by reducing costs.

⁶² For example, Unison noted in its submission to our problem definition paper that "there are likely to be significant long-term benefits to consumers from EDBs investing in smart grid technologies to increase asset utilisation, defer replacement investments and better manage growth-driven expenditure". See also Transpower's Transmission Tomorrow work, which concluded that the grid will continue to play a valuable role in New Zealand's energy system taking into account all the changes that Transpower anticipates may occur in coming decades (Transpower "Transmission tomorrow" (1 June 2016), p. 14, available at: <https://www.transpower.co.nz/about-us/transmission-tomorrow/about-transmission-tomorrow>).

83. The uncertainty surrounding this risk for EDBs' regulated activities suggests that we could reconsider our existing decision to primarily base asset lives on physical asset lives.

Proposed solution in respect of this problem

84. This section describes our proposed solution in respect of the risk of partial capital recovery problem which applies to non-exempt EDBs (ie, EDBs subject to price-quality regulation).

Our proposed solution

85. We propose a 'net present value (**NPV**) neutral' risk mitigation measure. We consider that the best way to reflect the higher uncertainty attached to the magnitude and direction of the risk of partial capital recovery is to allow EDBs to apply for a discretionary NPV-neutral shortening of their remaining asset lives. This would happen at the time of the DPP reset.
86. We propose that this adjustment be capped at a 15% reduction in remaining average asset lives as compared to the situation at the time of the DPP reset. EDBs may propose a smaller reduction, but the Commission would have final say over this quantum. We note that the IMs already allow EDBs to extend their asset lives.⁶³
87. The proposed solution would change our existing IM decision on asset lives to provide a mechanism for firms to elect new asset lives based on their assets' expected economic asset lives rather than their physical asset lives. Our proposed change to the IMs would then take effect at the next reset for EDBs.
88. We present the details of this asset lives adjustment in the Report on the IM review.⁶⁴

Reasons for preferring this solution

89. Our proposed solution mitigates the risk of potential future price shocks for consumers, which would likely be required to maintain the expectation of *ex-ante* FCM if (and when) the downside risk scenario became more likely. In that sense, this is a precautionary measure consistent with the nature of the problem – one of increased uncertainty. By allowing EDBs the option of a more rapid time profile of capital recovery, should the risk of widespread disconnections eventuate, the amount of remaining capital to recover at that time will be less than would otherwise be the case. Not permitting asset live adjustments now would risk increasing the materiality of any potential future adjustment to asset lives, if the risk became more likely. The resulting price shock would be larger, and we therefore consider that acting now is a prudent way for the IMs to reflect the changed environment.

⁶³ Commerce Commission "Input methodologies (electricity distribution and gas pipeline services) reasons paper" (22 December 2010), paras E10.33-E10.35.

⁶⁴ See decision AV17 in the Report on the IM review (which we expect to publish on 22 June 2016).

90. At the same time, *ex-ante* our proposed solution is NPV-neutral because EDBs should expect to still receive the same return on and of capital, consistent with the FCM principle and ensuring incentives to invest efficiently (s 52A(1)(a) and (b)).⁶⁵ Furthermore, if the risk of partial capital recovery does not actually increase, consumers do not end up paying an unnecessary ‘premium’ over time for this precautionary measure, consistent with limiting EDBs’ ability to extract excessive profits (s 52A(1)(d)).
91. Based on the 2015-2020 DPP model, and all other things equal, we estimate that a 15% reduction in remaining average asset lives would have resulted in an approximately 3-6% increase in starting prices (ie, average distribution charges), depending on EDBs’ individual circumstances. This would translate into around a short term 1-2% increase to the average electricity consumer bill, offset by lower prices in the longer term.⁶⁶
92. Because all other things are rarely equal, where an EDB applies an asset life adjustment prior to a DPP (or CPP) being set, we propose that the Commission will have the final say over the quantum of the average asset life reduction at the time of the next price reset. This is to ensure that accelerating cash-flows does not result in excessive price increases to consumers (on average).
93. Our proposed solution is only modest and partial. It likely does not fully mitigate the downside risk. This is intentional. EDBs ultimately bear the risk of economic network stranding (as opposed to asset stranding). They are therefore best placed,⁶⁷ and have the strongest incentive, to manage this risk, for example through pricing (eg, to ensure uptake of solar PV is not inefficiently incentivised). Our proposal expands their ability to mitigate this risk. We would expect EDBs to act if they genuinely see this risk increasing.
94. Given the uncertainty associated with this risk, we are open to reassessing the regulatory settings in the future, should circumstances change materially. Our proposal should clearly signal our continued adherence to the principle of *ex-ante* FCM.⁶⁸

⁶⁵ To the extent that EDBs recover the invested capital before the risk eventuates. If the risk eventuates before the capital is fully recovered, and no further changes to our regime can successfully maintain an expectation of *ex-ante* FCM at that time, then the NPV of suppliers’ investments might be negative. Our proposed solution makes this scenario less likely.

⁶⁶ This assumes that distribution costs account for about a third of the average consumer’s electricity bill.

⁶⁷ Our proposal to move to a revenue cap should facilitate pricing reform by removing the risk that changes to price structure or levels result in non-compliance with the price path or a revenue under-recovery.

⁶⁸ Commerce Commission “Input methodologies review draft decisions: Framework for the IM review” (16 June 2016), p. 37.

We considered ceasing RAB indexation as an alternative solution to this problem

95. We also considered ceasing to index EDB RABs for inflation, as Vector has questioned the principle of indexing the RAB in general.⁶⁹
96. Similar to shortening asset lives, this would have the effect of bringing cost recovery forward. It would be consistent with the current approach applied to Transpower. However, it would expose both consumers and EDBs to inflation risk (as explained in the Form of control and RAB indexation topic paper). In order to address this we would have to implement a consumer price index (CPI) wash-up as we have indicated we are open to for Transpower,⁷⁰ which would add further complexity.
97. Furthermore, we estimate that it would result in larger price rises (approximately a 7-10% increase in line charges depending on the EDB) than the asset lives option. This would risk worsening the problem.⁷¹

Implications for gas distribution businesses

98. This section discusses implications of emerging technology for GDBs and seeks evidence on whether there is a problem relating to the risk of partial capital recovery for that sector.

The risk of partial capital recovery for gas distribution businesses – issues raised by stakeholders

99. Some stakeholders have highlighted the risk of asset stranding for gas networks, mainly in the context of discussion about asset beta. We interpret this as economic network stranding rather than asset stranding, causing partial capital recovery, as discussed above, although the potential reasons for stranding differ from the electricity sector.
100. This risk of partial capital recovery is mainly driven by:
- 100.1 the discretionary nature of pipeline-delivered gas as a fuel for meeting domestic consumers' energy needs. For example, electricity can meet most of these energy needs, and bottled gas is an economic alternative for 'low' users;
- 100.2 the increasing competitiveness of economic alternatives to gas for meeting these needs (eg, electricity heat pumps for space heating). The degree of substitutability between gas and electricity will be influenced by whether the consumer has already invested in the relevant domestic equipment (eg, gas water heater) or not;

⁶⁹ Vector "Proposed scope, timing and focus for the review of input methodologies" (31 March 2015), para 3-5.

⁷⁰ Commerce Commission "Input methodologies review draft decisions: Topic paper 1 – Form of control and RAB indexation for EDBs, GPBs and Transpower" (16 June 2016), chapter 7.

⁷¹ Source: internal analysis based on 2015-2020 DPP model.

- 100.3 the lower penetration of piped gas may place GDBs closer to the ‘death spiral tipping point’. As the number of consumers per ‘unit’ of network is lower, the average cost may be higher and on the steeper side of the average cost curve.⁷² This in turn may imply that every disconnection causes average costs to rise by an increasing amount, making it increasingly likely that the remaining consumers will be unwilling to pay the costs, given the alternatives;
- 100.4 the fixed component of EDB prices (including capacity charges), which may increase in the coming years as they respond to emerging electricity technology developments. This would result in lower average per unit electricity prices, which would encourage greater electricity consumption (assuming consumers do not disconnect), potentially at the expense of gas;⁷³
- 100.5 those households with their own distributed generation (eg, rooftop solar PV) will likely have an incentive to consume it, again potentially at the expense of gas; and
- 100.6 the higher cost of safety regulations for gas is another factor that may discourage gas use.
101. On the other hand, GDBs also have the ability and incentive to grow connections (ie, they have an upside that is greater than for EDBs). We understand this is one of the main reasons why GDBs support maintaining the weighted average price cap as a form of control.⁷⁴ This may make the risk facing GDBs less asymmetric than for EDBs.
102. However, like EDBs, it is not clear to us whether this risk has materially increased for GDBs since 2010 when we set the IMs. We have proposed an optional shortening of asset lives for EDBs, and are open to considering it for GDBs as a way of partially mitigating the risk of partial capital recovery, if this risk has increased for GDBs (backed by evidence). We would need to model what the price implications of this might be.⁷⁵
103. However, given the evidence currently available to us, we do not propose any changes to the IMs for GDBs at this stage in response to the issues outlined above.

⁷² CEG “Relative risk of gas transport services: A report for Vector” (March 2016), pages 3-6.

⁷³ A caveat may be that peak electricity prices might discourage disconnections from the gas network, as it increases the attractiveness of gas use at peak times in the electricity network.

⁷⁴ See for example: Powerco “Submission on the four emerging view papers (29 February 2016)” (24 March 2016), para 18.

⁷⁵ There may be alternative methods for the mitigation or compensation of this risk for GDBs other than the shortening of asset lives. We remain open to exploring the options available in this area.

Chapter 4: Regulatory treatment of revenues and costs from emerging technology

Purpose of this chapter

104. This chapter explains the problems relating to the treatment of revenues and costs between regulated and unregulated services in respect of emerging technology, our proposed solutions in respect of these problems, and our assessment of other potential solutions. In other words, the issues in this chapter relate to the boundary between regulated and unregulated services.
105. This chapter also responds to a number of issues raised by stakeholders, in particular concerns raised by retailers about whether regulated suppliers should be allowed to deliver unregulated services using assets shared with the regulated services.

Structure of this chapter

106. This chapter begins with the problems we have identified in this area, and then for each of these sets out the problem definition, proposed solution and assessment of other potential solutions.
107. Many of the issues stakeholders raised in this area provided important background, but did not directly relate to the two problems we identified in this area, which we discuss in the sections immediately below. We present the issues stakeholders have raised in the second half of the chapter, and explain why we do not consider these issues amount to problems to be addressed in the IM review.

Problems identified

108. The way that costs are allocated between regulated and unregulated services has an important bearing on how efficiency gains from supplying both types of services together (ie, s 52A(1)(b)) are shared with consumers of regulated services over time (ie, s 52A(1)(c)), as well as whether investment by regulated suppliers in the provision of other services is not unduly deterred (ie, s 52T(3)).⁷⁶ It is important to note that the focus is on the services being delivered, not the choice of assets or technologies.
109. The cost allocation IM provides for three complementary approaches for EDBs and GPBs to allocate costs that are shared between regulated and unregulated services:
- 109.1 the accounting-based allocation approach (**ABAA**), which requires operating costs and asset values to be allocated based on causal factors, or based on proxy factors where causal-based allocators are not available;

⁷⁶ Section 52T(3) requires that our cost allocation IM must not unduly deter investment by a regulated supplier in the provision of other regulated or unregulated services.

- 109.2 the optional variation to the accounting-based allocation approach (**OVABAA**), which is available in those situations where the application of ABAA might unduly deter investments in unregulated services; and
 - 109.3 the avoidable cost allocation methodology (**ACAM**), where regulated and unregulated services have only a small proportion of their costs in common.⁷⁷
110. We have identified the following problems which relate to the cost allocation IM:
- 110.1 problem 1 which relates to the revenue materiality threshold; and
 - 110.2 problem 2 which relates to the use of proxy cost allocators.

Problem definition for problem 1: Revenue materiality threshold

111. In 2010, we decided that regulated suppliers should only be permitted to use ACAM if doing so would not have a material impact on their regulated revenue, compared to using ABAA. We considered that a material impact would be 1% of regulated revenue. This threshold was used for other issues such as the materiality threshold for re-opening price-quality paths.⁷⁸ For the purposes of cost allocation, this 1% threshold was interpreted as meaning approximately a 1%-2% impact.
112. As explained in Attachment B, the application of the revenue materiality threshold is no longer delivering the policy intent of the cost allocation IM, when applied by some EDBs. The current threshold for being able to apply ACAM is that total unregulated revenues must be less than 20% of total regulated revenues (from providing all types of regulated services). The problem is that the use of ACAM by some EDBs, even when under the threshold, results in regulated revenues being likely to increase by more than 1-2%, compared to applying ABAA, which we consider a material average price increase, with no corresponding benefit to consumers of regulated services.

⁷⁷ Where a regulated supplier provides more than one type of regulated service (eg, both electricity distribution and gas distribution services, the allocation across all regulated services must be no higher than the allocation resulting from ACAM applied to those services in aggregate. A summary of the cost allocation IM is provided in: Commerce Commission "Input methodologies review, emerging technology pre-workshop paper" (30 November 2015), Appendix 2.

⁷⁸ Commerce Commission "Input Methodologies (EDBs & GPBs) Reasons Paper" (22 December 2010), para 8.4.5.

Proposed solution for problem 1: Revenue materiality threshold

Our proposed solution – lower revenue materiality threshold from 20% to 10%

113. Our proposed solution in respect of this problem is to lower the revenue materiality threshold from the current 20% to 10%. The objective is to ensure that when EDBs or GPBs use ACAM, this does not result in increases to regulated revenue greater than 1-2%, compared to the use of ABAA.⁷⁹

Reasons for preferring this solution

114. Consistent with the framework for the review, we consider that this proposed solution would continue to maintain incentives on suppliers to promote efficiencies through diversification in other regulated and unregulated services (consistent with s 52A(1)(b) and 52T(3)), while at the same time better ensuring that the benefit of those efficiency gains are shared with consumers of regulated services (consistent with s 52A(1)(c)).
115. We considered maintaining the status quo, as supported by ENA,⁸⁰ but this would allow some suppliers to continue to use ACAM where evidence suggests this is resulting in a greater than 1-2% impact on regulated revenues. Therefore, consumers of the regulated service would bear a greater proportion of shared costs, and miss out on at least some efficiency gains (which would not promote s 52A(1)(c) as effectively).
116. In addition, we considered phasing out ACAM and requiring suppliers to use ABAA instead, as proposed by Contact Energy.⁸¹ However, we consider that our proposed solution minimises the additional compliance costs that might be incurred by requiring a larger number of suppliers to change their accounting systems to support the change in cost allocation approach, and delivers outcomes that are not materially different relative to the generalised use of ABAA.
117. The analysis supporting our proposed solution is set out in Attachment B.

Problem definition for problem 2: Use of proxy cost allocators

118. ABAA requires the regulated supplier to try to identify an activity (eg, staff time) which has caused the cost or asset utilisation in question over the last 18 months. This activity (referred to as a causal allocator) is then used as the basis for allocating Operating Costs not Directly Attributable (**OCnDA**) and/or Asset Values not Directly Attributable (**AVnDA**) between the services that the business offers.⁸²

⁷⁹ For our existing IM decision on the process for deciding the cost allocation approach, see existing decision CA03 in the Report on the review (which we expect to publish on 22 June 2016).

⁸⁰ ENA, "Submission on IM review: emerging technologies" (4 February 2016), para 8.

⁸¹ Contact Energy "Submission on Emerging Technology Pre-Workshop Paper: 30 November 2015" (4 February 2016) page 6.

⁸² For example, suppose that a regulated supplier decides that the number of staff has a causal relationship to the amount of rent which is incurred. Suppose also that the regulated part of the business employed 6

119. Where it is not possible to find an activity which directly drives cost or asset utilisation, the business may use a proxy allocator (eg, revenue), but it must provide us with the rationale for selecting this proxy.⁸³
120. When we set this IM in 2010, we adopted a non-prescriptive approach, providing regulated suppliers with a lot of flexibility in deciding which allocators to apply.
121. There are often multiple causal allocators available to a regulated supplier. Similarly, where no causal allocator exists, there may be multiple proxy indicators available. In both cases, the IM is not prescriptive as to which allocator suppliers should use.
122. The choices of allocators can have a large impact on the allocation of cost between the regulated and unregulated services. Since suppliers have an incentive to allocate as much cost as possible to the regulated part of the business, this may mean that the regulated business bears a greater proportion of costs than it should, and consumers of regulated services share in less of the efficiency gains arising from the supply of both regulated and unregulated services together.
123. We were alerted to this issue in 2010 and discussed it in the EDB/GPB Reasons Paper but ultimately decided to address this issue by requiring suppliers to disclose their reasons for their selection of allocators.⁸⁴ This allowed us to periodically review the appropriateness of the allocators selected and make changes to the rules where required. The only strict rule that we put in place is that regulated suppliers must use a causal allocator where it was available.
124. Although in the 2010 Reasons Paper we stated that we would require suppliers who elected to use a proxy allocator to justify its use, this requirement was not clearly carried over into the information disclosure requirements. As a result, the information we currently require is more limited than the 2010 IM decision suggests it would be.
125. Some suppliers have not been as rigorous as they could be in justifying the use of proxy cost allocators when applying ABAA. As a result, interested persons are sometimes not able to have the confidence that these suppliers are using proxy cost allocators appropriately.
126. The EDBs' disclosure data indicates that only 25% of allocators are causal and these allocators distribute only 13% of all cost and asset values. There is little to suggest that this is increasing over time.

staff members and the unregulated part of the business employs 4 staff members. Then 60% of office rent would be assigned to the regulated service and 40% to the unregulated service.

⁸³ See Commerce Commission "Input Methodologies (EDBs & GPBs) Reasons Paper" (22 December 2010), section B4 for further details.

⁸⁴ See Commerce Commission "Input Methodologies (EDBs & GPBs) Reasons Paper" (22 December 2010), sections 3.3.17 – 3.3.22 for further details.

127. Further, we have found that when cost/asset values are attributed based on causal allocators, less is attributed to the regulated activity (59%) than when proxy allocators are used (68%).
128. While none of this necessarily indicates that EDBs are applying the IMs incorrectly, we are concerned that proxy allocators are being used so heavily. Further, when we reviewed the justification provided by EDBs for their use of proxy allocators, we found that the information provided was often insufficient to allow us to form a view as to whether an appropriate causal allocator was available.

Proposed solution in respect of problem 2: Use of proxy cost allocators

Our proposed solution – strengthen requirement to justify use of proxy cost allocators

129. Our proposed solution in respect of this problem is to strengthen the requirement in the IMs to make it clear that the use of proxy cost allocators must be justified when applying ABAA. This will put greater onus on EDBs and GPBs to better demonstrate that:
- 129.1 a causal relationship cannot be established; and
 - 129.2 the proxy cost allocator selected is appropriate.
130. In order to implement this, we will also need to increase the quality of information we require under information disclosure. This will involve requiring additional information about why suppliers could not use a causal allocator and why their selected proxy allocator is appropriate.
131. Therefore, we also propose to require EDBs and GPBs to provide a declaration from their Chief Financial Officer that no causal allocator was available and that their selected proxy allocator was appropriate. This declaration would be similar to the managerial declaration already provided for in EDB IMs.⁸⁵ This information will help us assess whether the requirements need to be further tightened in future.⁸⁶
132. We consider that this solution would better give effect to our original intent of the application of the ABAA approach by ensuring that the flexibility to use proxy rather than causal allocators is only used where no causal approach is suitable. Given the sometimes limited reasoning provided for the use of proxy and causal allocators to date, we intend to give more attention to these compliance issues in future.

⁸⁵ Electricity Distribution Services Input Methodologies Determination 2012 [2012] NZCC 26, Clause 5.1.7(3).

⁸⁶ Especially if EDBs' involvement in unregulated activities grows, perhaps associated with greater deployment of emerging technologies.

Regulatory treatment of revenues and costs from emerging technology – issues raised by stakeholders

133. This section presents the main issues stakeholders have raised in this area. As noted above, many of these issues do not amount to problems to be addressed in the IM review. In the next section we set out our views and why we consider that these issues do not amount to problems to be addressed in the IM review.
134. The issues in this area have evolved over the last few months, and have been refined following the December 2015 workshop we held on the topic. We present the evolution of stakeholder views below.

Stakeholder views before the December 2015 emerging technologies workshop

135. Before the emerging technologies workshop, there seemed to be a lack of clarity and shared understanding regarding the regulatory treatment of costs and revenues from non-traditional investments in some emerging technologies. This was a key reason why we decided to hold the workshop.
136. Submissions on our problem definition paper raised various concerns, but articulated them differently, sometimes in conflicting ways. Some submissions highlighted the importance of flexibility in the cost allocation rules and standards for the assets that go into the RAB. For example, Vector said:

Cost allocation: More flexible allocation methodologies will be needed as boundaries between competitive and monopolistic market segments blur and change over time, challenging current regulated capex and opex allocations.

Asset valuation: Standards for what can be included in the RAB will need to be adjusted to accommodate new types of investment.⁸⁷

137. Other submissions said that too much flexibility can harm competition and stressed the importance of a ‘level playing field’ between regulated and non-regulated markets.

137.1 For example, Contact mentioned:

The need for a clear line between “grid level” network investment and “behind the meter” investment to avoid the potential for cross subsidisation by distribution businesses, and to ensure consumers bear only the appropriate costs and risks of the regulated services.

Where distribution businesses are involved in “behind the meter” services, ensuring their new technology businesses operate on an arm’s length basis from the traditional distribution business, to provide an open and level playing field in the market for energy services.⁸⁸

⁸⁷ Vector “Input methodologies review – Invitation to contribute to problem definition” (21 August 2015), para 10.

⁸⁸ Contact “Cross submissions on the Commission’s invitation to contribute to problem definition” (4 September 2015), section 1.

137.2 Similarly, Mighty River considered that:

providing greater flexibility potential[ly] runs the risk of restricting competition for the provision of such technologies by providing a regulated cost advantage which is not in the long term interests of consumers.

This points to the need for more robust tests and allocation requirement to ensure that only appropriate assets are included in the regulated asset base of electricity distribution businesses.⁸⁹

137.3 Finally, PwC (submitting on behalf of 20 EDBs) considered that the cost allocation IM is effective in its current form:

The cost allocation methodology can be applied successfully to a range of different business models and does not cause particular compliance problems. Seeking to prescribe the approach more closely would add cost rather than remove it and may impede the use of efficient business structures. We also see value in the various options – ABAA, ACAM, OVABAA – remaining in the IMs. Now that these have been developed there is only limited value in removing them from the IMs. We also consider that some of these features may become more widely used in the future as EDBs invest in non-traditional assets and services in response to consumer demand.

Where an EDB makes an investment in an alternative technology to defer traditional network reinforcement, it is clearly an investment that is being undertaken to provide electricity distribution services and should therefore be included in the RAB. Where the investment is used to supply both regulated and unregulated services the sharing component of the cost allocation IM applies.

The Consultation Paper questions what would happen if a third party made this investment. We are not sure why this is relevant – if the third party made this investment to sell the service to the EDB, that cost would be regulated opex for the EDB. If the third party invested in grid-scale battery storage for a different reason then it would not be providing electricity distribution services and should not fall within the RAB.⁹⁰

138. The above views, especially those challenging the effectiveness of the cost allocation IM, led us to place added emphasis on reviewing this IM. The results of this effectiveness review led to the proposed changes presented at the beginning of this chapter.

Stakeholder views following the December 2015 emerging technologies workshop

139. After the workshop, clearer stakeholder views emerged, which we have organised around the following themes:

139.1 the legal definition and interpretation of the regulated service;

⁸⁹ Mighty River Power “Input Methodologies Review: Cross-submission on invitation to contribute to problem definition” (4 September 2015).

⁹⁰ PwC “Submission to the Commerce Commission on Input methodologies review: Invitation to contribute to problem definition” (21 August 2015), pages 20 and 28.

139.2 the appropriateness of the cost allocation IM and potential need for revenue allocation rules; and

139.3 industry structure and potential restrictions on suppliers of the regulated service delivering unregulated services using shared assets.

140. Below we present a non-exhaustive selection of representative views for each theme. We respond to these views in paragraphs 160 to 203, except for the points raised on revenue allocation rules, which we address in paragraphs 149 to 150.

The legal definition and interpretation of the regulated service

141. The ENA (representing 29 regulated EDBs), was supportive of the definition and interpretation we presented in the pre-workshop paper that assets (or costs) used to provide (or attributable to) the regulated service fall within the scope of regulation.

The ENA agrees with the Commission's interpretation of the definition of electricity lines services, as set out in the pre-workshop paper. We consider that this is the clear meaning of the definition.⁹¹

142. Electricity retailers advanced an alternative view, which the ERANZ articulated. In short, ERANZ considered that we are not appropriately interpreting the definition of the regulated service, and that our treatment of emerging technologies is inconsistent with the Part 4 purpose. Furthermore, our interpretation is:

...effectively re-defining the regulated service by seeking to include in that definition emerging technologies... this unnecessarily increases the potential scale and scope of the regulated monopoly business by including assets and goods/services that can be provided by a competitive market.⁹²

The regulatory treatment of emerging technologies should be consistent with the inherent nature of the products, services or activities being directly facilitated or produced by the technology. Above all, the key characteristic of the service or activity should be the extent to which it is, or may become, suitable for provision under workable competition.⁹³

⁹¹ ENA, "Submission on IM review: emerging technologies" (4 February 2016), para 5.

⁹² Electricity Retailers' Association of New Zealand (ERANZ), "Submission of Emerging Technologies – Workshop and Pre-workshop paper" (4 February 2016), p. 5.

⁹³ Electricity Retailers' Association of New Zealand (ERANZ), "Submission of Emerging Technologies – Workshop and Pre-workshop paper" (4 February 2016), p. 7.

The appropriateness of the cost allocation IM and potential need for revenue allocation rules

143. Regarding the appropriateness of the cost allocation IM, the views of some EDBs shifted after the workshop such that there appears to be widespread support for the status quo among this group of stakeholders. For example, on the issue of whether the cost allocation IM was too flexible, Vector considered that:

The current cost allocation methodologies are fit for purpose. There is no issue with the regulatory allocation of costs and revenues in response to emerging technologies that needs to be addressed as part of this IM review.⁹⁴

144. Similarly, the ENA agreed that:

The current cost allocation IM is based on a set of principled arguments, is consistent with the requirements of the Act and the current materiality thresholds are appropriate. There is no evidence that the current IM, and established materiality limits, are not fit-for-purpose with the advent of emerging technologies.⁹⁵

145. On the other hand, a widely held view among electricity retailers is that instead of relying on cost allocation rules, the regime should “rely on a market price... to assign a value to the benefit an emerging technology delivers to the regulated service.”⁹⁶ For example, the ERANZ submitted that:

The cost allocation mechanisms are relatively blunt instruments that do not work well at the margins of burgeoning markets. While there may be (or may have been) some benefit in “assisting” regulated suppliers to invest in areas where investment might otherwise not be forthcoming (e.g. due to the scale of investment required, as for a fibre optic cable roll-out) the cost allocation methodologies also provide significant but unnecessary benefit to the regulated supplier in areas where that supplier might be competing with other parties.

Refinement to the cost allocation methodologies (as might be implemented through amendment to the cost allocation IM) are likely to be challenging and have uncertain outcomes. However, with a workably competitive market, appropriate pricing of the network benefit received as a result of investment in batteries achieves the required outcome (an appropriate cost imposition on consumers of the regulated service) in a far more reliable manner.⁹⁷

⁹⁴ Vector, “Submission on emerging technology pre-workshop paper: 30 November 2015” (4 February 2016), para 2.

⁹⁵ ENA, “Submission on IM review: emerging technologies” (4 February 2016), para 8.

⁹⁶ Electricity Retailers’ Association of New Zealand (ERANZ), “Submission of Emerging Technologies – Workshop and Pre-workshop paper” (4 February 2016), p. 3.

⁹⁷ Electricity Retailers’ Association of New Zealand (ERANZ), “Submission of Emerging Technologies – Workshop and Pre-workshop paper” (4 February 2016), p. 16.

146. Likewise, Contact expressed corresponding views favouring ‘ring-fencing’ in order to support the creation of a market. It nevertheless added that in the context of cost allocation, the ABAA is preferable:

Our primary submission is that ring fencing investment in emerging technologies would be a sounder approach than fine tuning the cost allocation methodologies.⁹⁸

147. Regarding treatment of revenues related to emerging technologies (discussed in the context of a grid-scale battery), ERANZ considered that:

...if the battery is considered to be performing regulated services then revenue earned in the performance of those services should also be treated as regulated. Noting that allowed revenue is inflated due to the impact of capital and operating costs on the building block analysis, it would be appropriate for an assessment of wholesale energy revenue from discharging the batteries (for regulated service purposes) should be deducted in the allowable revenue calculation. This would ensure that consumers of the regulated service did not pay twice.⁹⁹

148. Conversely, the ENA’s view was that a revenue allocation IM is not necessary at this time.

We consider that the cost allocation IM has the equivalent effect; i.e. that the costs are allocated out of the regulated business and thus must be covered by the unregulated revenues.¹⁰⁰

...

It is conceivable that an ENB could provide a demand management service or product to a consumer that comprises both regulated and unregulated services to that consumer and the consumer pays a single bill directly to the ENB for that service.

We note it is unlikely that an ENB could send a bundled bill to a consumer that included the standard lines charges (e.g. the c/kWh or c/day charges) unless the ENB has a direct billing relationship with the customer. At present only one ENB directly bills all of its consumers. For other ENBs, retailers can, and do, re-bundle the lines charges they receive from ENBs and the consumer then pays the re-bundled charge. Accordingly, on the basis that the current industry structure prevails, the ENA does not consider that bundling of lines charges and unregulated service charges is likely to be a material problem.¹⁰¹

149. We consider that this issue can be addressed, to the extent it becomes material in future, with the tools and discretion currently available under regulatory determinations (ie, s 52P determinations), rather than revenue allocation rules at the IM level.

⁹⁸ Contact, “Submission on the Commerce Commission’s Emerging technology pre-workshop paper: 30 November 2015 (Workshop paper)” (4 February 2016), p. 6.

⁹⁹ Electricity Retailers’ Association of New Zealand (ERANZ), “Submission of Emerging Technologies – Workshop and Pre-workshop paper” (4 February 2016), p. 22.

¹⁰⁰ ENA, “Submission on IM review: emerging technologies” (4 February 2016), para 76.

¹⁰¹ ENA, “Submission on IM review: emerging technologies” (4 February 2016), paras 58-59.

150. Particularly, when setting price paths in either a DPP or a CPP setting, the Commission has discretion to determine an amount for ‘other regulated income’ and factor it into the price path in the case of a weighted average price cap, or in the case of a revenue cap, to scrutinise the amount of other regulated income being disclosed for compliance purposes.¹⁰² Any future revenue resulting from the use of emerging technologies, and associated with the supply of electricity distribution services, could be appropriately recognised as part of ‘other regulated income’.¹⁰³

Industry structure and potential restrictions on suppliers of the regulated service delivering unregulated services using shared assets

151. The Electricity Authority has sent a letter to us on this topic, where it outlines its thoughts and queries.¹⁰⁴ The letter noted the Electricity Authority’s and the Commission’s overlapping interests in emerging technologies, and outlined the potential implications of the Commission’s cost allocation approach on competition in the wholesale spot and ancillary markets. We have published the letter as part of our draft decisions and welcome stakeholder comment on it.
152. Rather than refining the cost allocation IM, ERANZ proposed what it considers a materially better approach in order to assign a value to the benefit an emerging technology delivers to the regulated service. It aims to promote the creation of a market with a corresponding market price:

ERANZ believes that a materially better approach is to require that domestic scale batteries are only included in the RAB if they meet certain criteria... which confirm they are not likely to be provided in markets where competition might develop. To achieve this, our proposal is that if an EDB invests directly in domestic scale batteries and includes domestic scale batteries in the RAB then the “value of commissioned assets” should be required to be zero. EDBs would then be much better [able] to make any such investments in domestic scale batteries beyond the point of supply through an arms-length related party, distinct from the regulated service. The EDB could then acquire those (battery generated) services that support the provision of the regulated services, on an arms-length and transparent basis. Alternatively the EDB could acquire the service from other entirely unrelated third party providers (in either case the cost would form a legitimate cost of the regulated service).¹⁰⁵

¹⁰² Other regulated income means “income associated with the supply of electricity distribution services other than through prices, investment-related income, capital contributions, or vested assets”. Note that our review of the current definition of ‘capital contributions’ is set out in the Report on the Review (which we expect to publish on 22 June 2016).

¹⁰³ For an explanation of how we regulate, and some worked examples of how our rules treat investments in some emerging technologies, see: Commerce Commission “Input methodologies review – Emerging technology pre-workshop paper” (30 November 2015).

¹⁰⁴ Letter from Carl Hansen (Chief Executive, Electricity Authority) to Sue Begg (Deputy Chair, Commerce Commission) on implications of regulatory treatment of cash flows for emerging technology (1 June 2016).

¹⁰⁵ Electricity Retailers’ Association of New Zealand (ERANZ), “Submission of Emerging Technologies – Workshop and Pre-workshop paper” (4 February 2016), p. 18. We understand that ERANZ’s proposal

153. In order to give effect to the proposal (ie, identify which assets should be given a value of zero if added to the RAB), ERANZ submits that we create a new schedule which would include the “criteria for assessing if an asset and/or the service benefits provided by the asset are or could be provided through workable competition.” The schedule would also contain the current list of assets/services identified as meeting the requirement, and the process to make changes to the list.
154. Three observations on ERANZ proposal that are relevant for our response in paragraphs 180 to 183:
- 154.1 the proposal is different to the common understanding of the term ‘ring-fencing’ in that it does not involve specifying the ‘terms of separation’ between the EDB and the potential related party (eg, accounting, functional, legal, ownership separation). We understand that the key feature to the proposal is that any potential transaction between the EDB and the third party would be ‘at arms-length’ – ie, transacting at third party terms (price and non-price) as if the transaction was between unrelated parties;
- 154.2 however, the aim of ERANZ proposal – to achieve arms-length transactions – is the same as under more traditional forms/degrees of separation. Therefore, it can be regarded as a structural intervention (or pseudo-structural at least); and
- 154.3 the proposal would be implemented through the asset valuation IM, not the cost allocation IM.
155. Another stakeholder concern was that where EDBs invest in assets that deliver both regulated and unregulated services, they may not have incentives to realise the full value of these investments, to the detriment of consumers. This point was also presented in support of placing restrictions on EDBs’ ability to own certain emerging technology assets:

For example, if an investment in alternative technologies could provide services in addition to conveyance services the full value of the investment could be attributed to consumers and deny consumers the additional benefits that could be derived. This is inefficient and could be avoided by the competitive provision of all the services of the technology.¹⁰⁶

applies broadly to other assets and technologies, so in this quoted fragment, the term ‘domestic scale batteries’ can be used interchangeably with ‘other current and emerging technologies’.

¹⁰⁶ Contact, “Submission on the Commerce Commission’s Emerging technology pre-workshop paper: 30 November 2015 (Workshop paper)” (4 February 2016), p. 3.

156. An additional concern was that EDBs may be able to earn additional returns from assets included in the RAB (eg, from ancillary services) without consequential adjustments to the regulated return.¹⁰⁷
157. On the other side of the argument, the ENA did not consider that the Commission is best placed to impose structural restrictions:

Fundamentally we do not agree that the best way to promote competition in a new market, such as the battery storage and electric vehicle charging markets, is to use Part 4 regulation to restrict investment decisions by regulated firms in these markets.

It is not the Purpose of Part 4 regulation to impose structural regulation on ENBs through use of cost allocation and asset valuation IMs. If there are concerns about ENBs' involvement in related markets, then these issues should be addressed by policy-makers through, for example, the Electricity Industry Act 2010 (EIA).¹⁰⁸

158. Commenting on the merits of structural restrictions, the ENA considered that "Prohibiting any particular model for procuring the services potentially provided by emerging technologies is likely to create inefficiency", adding that:

The costs of imposing onerous ring-fencing requirements on all ENBs would be real and immediate. Potential benefits of restricting ENB investments in emerging technologies are unclear. In fact, it may be detrimental as the market may not emerge at all if ENBs are not active. A better approach is for the Commission and policy makers to continue to monitor technology and market developments and intervene only if necessary.¹⁰⁹

159. Finally, the ENA noted that regulated suppliers have been investing in services in the way that ERANZ wants to discourage:

ENBs have invested in demand management services for many years (e.g. through ripple control or mobile generators) and this is a legitimate part of network management. It seemed the suggestion at the workshop was to ring-fence all ENB demand management services, which would be impractical and impose additional costs for a service ENBs have been providing for years.¹¹⁰

Our perspective on the main issues raised by stakeholders

160. This section presents our perspective on the main issues presented in the above paragraphs and why we consider that they do not amount to problems to be addressed in the IM review.

¹⁰⁷ Contact, "Submission on the Commerce Commission's Emerging technology pre-workshop paper: 30 November 2015 (Workshop paper)" (4 February 2016), p. 3.

¹⁰⁸ ENA, "Submission on IM review: emerging technologies" (4 February 2016), para 10.

¹⁰⁹ ENA, "Submission on IM review: emerging technologies" (4 February 2016), paras 12 and 14.

¹¹⁰ ENA, "Submission on IM review: emerging technologies" (4 February 2016), para 12.

161. Our emerging technology pre-workshop paper contains relevant background that complements the views we present below.¹¹¹ For example, our view regarding the definition and interpretation of the regulated service remains unchanged (although we expand on this below). In addition, readers should refer to that paper for an explanation of the cost allocation IM, and a recap on what and how we regulate.

We do not consider ERANZ's proposal promotes the long-term benefit of consumers

162. ERANZ provided a detailed proposal which ultimately aims to deliver a market price for the services delivered by emerging technologies. It relies on restrictions on EDBs' ability to include some assets in their RAB.
163. We do not consider that ERANZ has made the case that its proposal better promotes the long-term benefit of consumers of the regulated service. Part of the rationale that underpins the proposal rests on a different interpretation from ours of the legal definition of the regulated service. We explain this in the next section.
164. Aside from the interpretation of the legal definition of the regulated service, we are unconvinced that ERANZ's proposal would benefit consumers of the regulated service. This is primarily because the requirement of arms-length transactions risks undermining the incentive on EDBs to improve efficiency through diversification (ie, economies of scope), consistent with s 52A(1)(b).¹¹² The likely higher transaction costs associated with arms-length transactions is one important (and growing) factor that could cause this.
165. We note that it is plausible, if unclear to us at this stage, that the benefits of the above-mentioned economies of scope may be outweighed by the benefits associated with a requirement for market transactions (eg, cost efficiencies) for delivering the services (both regulated and unregulated) that some emerging technologies can deliver. However, as we explain below, we do not consider the case has been made for regulators to mandate market transactions in place of integration.
166. In addition, as noted above, s 52T(3) requires that our cost allocation IM must not unduly deter investment by a regulated supplier in the provision of other regulated or unregulated services. This suggests that EDBs should be able to benefit from their existing assets and activities when providing new services.¹¹³ Consumers of regulated services will be the ultimate beneficiaries of the economies of scope realised by regulated suppliers from engaging in new activities, consistent with s 52A(1)(c).

¹¹¹ Commerce Commission, "Input methodologies review: Emerging technology pre-workshop paper" (30 November 2015).

¹¹² See appendix 2 of the pre-workshop paper for an explanation of how the cost allocation IM promotes efficiency through diversification. Commerce Commission, "Input methodologies review: Emerging technology pre-workshop paper" (30 November 2015), Appendix 2.

¹¹³ We note ERANZ's point that their proposal relates to the 'asset valuation IM', and therefore in ERANZ's view it is not in conflict with s 52T(3). Even so, their proposal restricts EDBs' ability to benefit from their existing assets when providing new services, by implicitly not allocating asset-related common costs to the regulated business (refer s 52T(1)(a)(iii)).

167. Recent work suggests that “economies of scope and coordination will become increasingly important” as a result of growing deployment of widespread emerging technologies.¹¹⁴ It also raises questions on the desirability of the existing industry structure:

In an increasingly innovative even disruptive market, technological advances are no longer limited to the discreet market layers that emerged from the post-Hilmer reforms. In such an environment, scope economies between network and some contestable services are likely to be valuable for customers. Furthermore, the networks themselves face competition in the form of feasible ‘off-grid’ alternatives to network supply, which may become even more commercially attractive for customers as the costs of the emerging technologies decline. There is a compelling case for allowing NSPs [network service providers] a greater involvement in contestable markets and to compete to supply an ‘on-grid’ alternative to ‘off-grid’ supply.

... the vertical separation that arose, with strong justification, from Hilmer is now unlikely to be the best means of delivering this outcome ... Scope economies are becoming more important relative to scale economies, which means that industry structure and regulation, in particular, must focus more on measures that, unlike structural and functional separation, do not impede the availability of new technologies, and with them the emergence, internalisation and transfer to final customers of the benefits of scope economies.

... it is important that regulation does not frustrate the generation of these scope economies whether through proscription, by removing incentives for NSPs to participate, or by imposing discriminatory participation costs that are large in comparison with the scope economies.¹¹⁵

168. As we would expect, we see evidence of some EDBs and regulators responding by either starting or facilitating the transition towards new roles for electricity distribution companies.^{116, 117} These new roles have been variously characterised, but probably share the attribute of more active network management.
169. The precise nature of future electricity distribution networks is uncertain and currently subject to wide international debate. We consider that imposing regulatory restrictions on EDBs’ ability to efficiently respond to the changing environment is not appropriate at this stage.

¹¹⁴ Lawrence Berkeley National Laboratory, “Electric Industry Structure and Regulatory Responses in a High Distributed Energy Resources Future” (November 2015), p. 1.

¹¹⁵ Synergies Economic Consulting, George Yarrow, “Applying the Hilmer Principles on economic regulation to changing energy markets: A report prepared by Synergies Economic Consulting and George Yarrow for the Energy Networks Association”, April 2016, pp. 39, 41 and 63. Available at: <http://www.synergies.com.au/applying-the-hilmer-principles-on-economic-regulation-to-changing-energy-markets/>.

¹¹⁶ For example, Powerco aims to evolve to a “Distribution System Integrator”. Powerco, “Delivering New Zealand’s energy future: electricity asset management plan 2016” pages 138-140.

¹¹⁷ For example, Ofgem sees a role for them in facilitating DNOs transitioning to new roles. Ofgem, “Making the electricity system more flexible and delivering the benefits for consumers” (30 September 2015), p. 25.

170. Implementation of ERANZ’s proposal entails costs and added complexity that are more certain than the benefits it could deliver to consumers of the regulated service. On the costs side, it relies on a new asset-specific schedule with the criteria to assess if an asset and/or the service provided by the asset are or could be provided through workable competition. It would also contain a list of assets/services that meet the requirement and the process to make changes to the list to keep it current. Beyond the costs and complexity involved, this represents a departure from our current approach to regulation, which is asset/technology agnostic.¹¹⁸
171. On the benefits side, the added costs and complexity could be justified if there was clearer, compelling evidence that the benefits to consumers of the regulated service outweigh the costs. Our understanding is that the objective, outcome and benefit of ERANZ’s proposal is as follows.
- 171.1 Objective: to promote competitive markets where this is compatible with the nature of the assets and services, by eliminating what it sees as an “undue competitive advantage” enjoyed by EDBs vis-à-vis willing third parties as a result of the cost allocation IM.
- 171.2 Outcome: the potential creation of a new workably competitive market(s) for services (potentially both regulated and unregulated) delivered by emerging technologies, and the associated market prices.
- 171.3 Benefit: potentially appropriate pricing of the network benefit received by EDBs (and therefore appropriate cost imposition to consumers of the regulated service).
172. In other words, the benefits are conditional on the creation of a workably competitive market that does not fully exist today.
173. One way of characterising the issue is to ask whether consumers’ interests are best served by regulators mandating market transactions in place of integration, rather than letting efficiency considerations determine the outcome. The answer to this question will depend on the specific context in which it is asked. Factors including transaction costs, economies of scale, scope, and externalities will influence the answer.¹¹⁹ Regulators should only consider intervening where there is a market failure (eg, risk of exercise of exclusionary market power) such that markets would not produce an efficient outcome. ERANZ seems to have taken the view that market transactions, instead of integration, are in consumers’ best interests in this case and at this stage. We do not consider that ERANZ has provided sufficient evidence to demonstrate that the factors that need to be present for a market to be the most efficient industry structure are present in the current context.

¹¹⁸ We regulate a service as defined by Parliament. The assets and technologies involved in delivering the regulated service may change over time.

¹¹⁹ For example, Coase showed in its 1937 paper “The Nature of the Firm” that firms exist because “there is a cost of using the price mechanism”. So transacting through the market can be costlier than within a firm.

174. Nevertheless, a market may yet develop; one in which market players compete on the basis of their competitive advantage, free from regulatory constraints. We do not consider the cost allocation IM stands in the way of this.
175. We do not consider that the cost allocation IM gives EDBs an undue advantage. This IM is intended to ensure that consumers of regulated services benefit over time from any efficiency gains achieved by EDBs supplying regulated and unregulated services together, consistent with s 52A(1)(c). As a consequence, consumers of unregulated services also benefit from these efficiencies.
176. EDBs may be able to achieve such efficiency gains because they can use their existing regulated activities to achieve economies of scope, which may give them an efficiency advantage (ie, a competitive advantage) relative to other market participants who are not able to do likewise. The High Court has acknowledged the potential existence of a competitive advantage, and observed that this outcome is consistent with s 52T(3):
- [Section] 52T(3) refers to investment by a regulated supplier in the provision of other goods or services including, of course, unregulated goods and services, which s52A(1) does not specifically deal with.
- We think a reasonable approach to considering s 52T(3) is that, so long as the unregulated service receives some portion of efficiency gains (and thus bears less than its SAC [stand alone cost]), it potentially has a competitive advantage over a firm that does not have existing regulated service infrastructure to draw upon. If that condition is met, investment in the unregulated service will not be unduly deterred.¹²⁰
177. Furthermore, application of the ACAM, which is the methodology that would allow the allocation of the greatest proportion of shared costs to the regulated service, should still implicitly result in no less than the incremental cost of all unregulated services being allocated to those services (in aggregate). In general, pricing between incremental and standalone cost is unlikely to raise competition concerns in New Zealand unless the EDB is considered to be taking advantage of its market power for an exclusionary purpose. To the extent that EDBs engage in predatory pricing or other illegal anti-competitive conduct, the competition provisions in Part 2 of the Act would apply.
178. Finally, other existing or potential participants in the relevant markets may benefit from competitive advantages of their own, which EDBs may not have. For example, retailers may have the competitive advantage of a direct relationship with consumers.
179. In any case, matters of industry structure and the creation of markets are areas which are not best addressed by Part 4, as the next section explains.

¹²⁰ *Wellington Airport & others v Commerce Commission* [2013] NZHC 3289 at [1860]-[1861].

Industry structure is a matter for policy makers

180. A number of parties submitted that EDBs should be restricted in their ability to participate in emerging technologies markets. For example, some parties submitted that we should require regulated companies to procure services from some emerging technologies on an arm's length basis, while some suggested that ring-fencing requirements be imposed. Submitters pointed to initiatives in other jurisdictions such as Australia and United Kingdom as support for the proposition that ring-fencing measures should be implemented.¹²¹
181. Notwithstanding our reservations with ERANZ's proposal, we view it and the ring-fencing requirements proposed by other submitters as structural interventions. We consider that Part 4 regulation is not the vehicle to introduce structural remedies. Matters of industry structure in New Zealand have in the past been decided by policy makers and implemented through legislation. Provisions dealing with the separation of electricity distribution from generation and retailing are found in the Electricity Industry Act 2010, which is administered by the Electricity Authority.¹²²
- Under the Electricity Industry Act 2010, the Authority can create markets and provide for broader participation in existing markets... We have also worked with Transpower and the Commerce Commission to put in place measures to address the adverse effects on competition of the Transpower demand response programme.¹²³
182. The tools available to us under Part 4 were not designed to effect, and cannot directly deliver, changes to industry structure. Our understanding of ERANZ's proposal is that it intends to achieve an equivalent effect to a structural solution (ie, arm's length transactions) using the tools available to us under Part 4 (in particular, the asset valuation IM) to place incentives on EDBs to act in a way consistent with how they would act under a structure featuring a greater degree of separation.
183. Therefore, our view is that structural changes, if deemed necessary (which we consider they are not at this stage), are best delivered directly by policy makers through legislation, rather than indirectly by the Commission through changes to Part 4.

Definition of the regulated service

184. Section 54E of the Act declares that "electricity lines services are regulated" under Part 4. The meaning of 'electricity lines services' incorporates the definition of 'lines' from the Electricity Act 1992 "unless the context otherwise requires".

¹²¹ We note that 'ring fencing' is a broad term, and different jurisdictions appear to use it to refer to different types of interventions.

¹²² Electricity Industry Act 2010, Part 3.

¹²³ Letter from Carl Hansen (Chief Executive, Electricity Authority) to Sue Begg (Deputy Chair, Commerce Commission) on implications of regulatory treatment of cash flows for emerging technology (1 June 2016).

185. In our pre-workshop paper, we set out the relevant questions to consider when assessing the scope of the regulated service. These are:
- 185.1 Is what the supplier is doing part of a service where the service is the conveyance of electricity by line in New Zealand?
- 185.2 Is what the supplier is doing part of a service where the service is not excluded by any of the exceptions listed in s 54C(2)?
186. While we noted the exceptions from the definition of ‘line’ in the Electricity Act 1992, we explained that we do not consider these exceptions operate to exclude certain types of assets from being used to support a regulated service. Rather, we consider that the definition of ‘line’ in the Part 4 context is relevant only to the extent that it describes the nature of the regulated service— ie, what the network is. In addition, there is no requirement for every asset used to support a regulated service to fall within the definition of a ‘line’. Thus, assets used to support the conveyance of electricity by line comprise part of the regulated service.
187. A number of parties disagreed with our interpretation of “electricity lines services”, claiming our approach is too broad and results in the regulation of services that that are subject to competition.¹²⁴
188. Contact Energy submitted that Part 4 is not intended to regulate services that are subject to competition, and pointed to the wording of the provisions of Part 4, specifically:¹²⁵

The statements in section 52 that Part 4 provides for the regulation of services in markets where “there is **little or no competition** and little or no likelihood of a substantial increase in competition”,

Section 52A purposes are designed to “replicate outcomes produced in competitive markets”,

Sections 54C(2)(a) – (d) which exclude from the regulated lines services lines services which are not used to provide a monopoly transport service , and

Section 54C(2)(e), which **excludes** from the regulated service services that involve “conveying of electricity...**by a line or lines that are mostly in competition with a line or lines** operated by another supplier of electricity lines that is not an associate of that person”.

(emphasis in the original)

¹²⁴ ERANZ “Submission on emerging technologies – Workshop and pre-workshop paper” (4 February 2016), page. 4.

¹²⁵ Contact Energy “Submission on the Commerce Commission’s emerging technology pre-workshop paper: 30 November 2015 (workshop paper)” (4 February 2016), Appendix A.

189. Similarly, ERANZ submitted that our approach is a redefinition of the regulated service which effectively expands the scope of regulated activities,¹²⁶ and that, contrary to the intent of Part 4:¹²⁷

[s]ervices that are substitutes for, or functionally equivalent to, the conveyance of electricity by line are therefore included in the definition of the regulated service.

190. Consistent with the above, some submitters disagreed that batteries could be used to support the provision of the regulated service. For example, ERANZ argued that batteries:¹²⁸

store energy, they do not convey it. Nor are they, in any ordinary sense of the word, a 'line'.

(emphasis in the original)

191. Thus, in ERANZ's view, batteries are 'electrical installations' which are excluded from the definition of 'line' under the Electricity Act and therefore:¹²⁹

...it does not seem appropriate that something is considered to 'support the regulated service' when the definition of the regulated service has been constructed in such a way as to exclude that thing.

192. By contrast, other parties agreed with our approach. The ENA submitted that excluding batteries from the scope of lines would have perverse effects.¹³⁰ For example, other non-lines related assets would also be excluded (like office chairs) because they did not fall within the definition of 'lines'.

193. We remain of the view that our approach to defining the regulated service, as set out in detail in the pre-workshop paper, is appropriate.

194. First, it is important to note that the focus of the definition of the regulated service is on the service provided, not on specific types of assets. Although assets are relevant insofar as they are used to support the service, where an asset is used in a way that does not support the regulated service – that is, used to provide a non-regulated service – it is the use of the asset that is excluded from the service, not the asset itself.

¹²⁶ ERANZ "Submission on emerging technologies – Workshop and pre-workshop paper" (4 February 2016), page. 5.

¹²⁷ ERANZ "Submission on emerging technologies – Workshop and pre-workshop paper" (4 February 2016), page. 6.

¹²⁸ ERANZ "Submission on emerging technologies – Workshop and pre-workshop paper" (4 February 2016), page. 8.

¹²⁹ ERANZ "Submission on emerging technologies – Workshop and pre-workshop paper" (4 February 2016), page. 9.

¹³⁰ ENA "Submission on IM review: emerging technologies" (4 February 2016), paras 19 and 48.

195. As set out in examples in the pre-workshop paper, an asset can be used to provide both regulated and non-regulated services. For example, where an EDB owns and controls a battery ‘behind the meter’ on a consumer’s premises, it could be used in both ways. Where this is the case, suppliers must apply the cost allocation IMs to determine the appropriate treatment of costs and revenues attributable to the use of the battery for regulated services.
196. In this respect, it is important to note that, while suppliers have some discretion on the assets they use to support the regulated service, the onus of proof is on them to justify that the costs and revenues attributed to those assets relate to the delivery of the regulated service and have been allocated in the appropriate proportions.
197. Second, in our view there is no requirement that all assets used to support the conveyance of electricity by line must themselves be ‘lines’. The definition of ‘line’ in the Electricity Act is incorporated into ‘electricity lines services’ “unless the context otherwise requires.” Thus, ‘line’ must be interpreted in the context of the purpose of Part 4 when used in relation to the definition of the regulated service. In our view, it is unlikely that this term, which excludes certain classes of assets, is intended to operate to restrict the scope of the regulated service under Part 4.
198. This is supported by the practical application of the term: if the exclusions in the Electricity Act definition operated to exclude ‘non-lines’ assets legitimately used to support the regulated service, equipment such as office chairs, printers and telephones, which are legitimately used to support the regulated service, would be excluded. Such equipment currently forms part of the RABs of EDBs (and other regulated entities).
199. Finally, even if the definition of ‘line’ in the Electricity Act operated to exclude certain assets (which we say it does not), fittings used “in association with” the conveyance of electricity by distribution lines are explicitly not excluded. This further supports our view that ‘non-lines’ assets – even those ‘beyond the meter’ – can support the regulated service.¹³¹

Incentives on suppliers to act in the best interest of consumers

200. Our emerging technology pre-workshop paper recapped what and how we regulate. A fundamental attribute of our regulatory regime is that it incentivises EDBs to improve efficiency.¹³² The basic way in which we do this is by capping the revenues that EDBs can recover from customers of the regulated service. We do that at the start of the five-year regulatory period, and that cap remains until revenues are reset prior to the next regulatory period.

¹³¹ There was some discussion at the pre-workshop about whether EDBs installing lightbulbs in consumers’ houses, eg, for the purpose of deferring capex, could be legitimately included in their RABs. While we think this may be possible in theory, at this stage it is unclear to us how the costs and revenues associated with these assets could be sufficiently evidenced to allow their inclusion in the RAB.

¹³² This is recognised as being part of the purpose of Part 4 regulation in s 52A(1)(b) of the Commerce Act.

201. By capping revenues, EDBs are incentivised to find more cost-effective ways of delivering the regulated service.
202. Contact raised a concern that EDBs may not have incentives to realise the full value of investments, to the detriment of consumers (see paragraph 155). We do not see why an EDB would not seek to derive the full benefit from their investments, regardless of whether they are in the provision of the regulated or the unregulated service.
203. An additional concern raised by Contact was that EDBs may be able to earn additional returns from assets included in the RAB (eg, from ancillary services) without consequential adjustments to the regulated return (see paragraph 156). Our cost allocation IM is designed to address this issue by, on the one hand, balancing the requirement not to unduly deter investment by suppliers of regulated services in other goods and services, and on the other hand, ensuring that efficiency gains are shared with consumers of the regulated service.

Attachment A: Evidence on risk of network asset stranding

Purpose of this attachment

204. This attachment presents evidence to inform the assessment of the risk of network asset stranding, which is discussed in Chapter 3.

Problem validation - evidence (I)



- Cost of PV and storage falling (ie potential network substitutes)

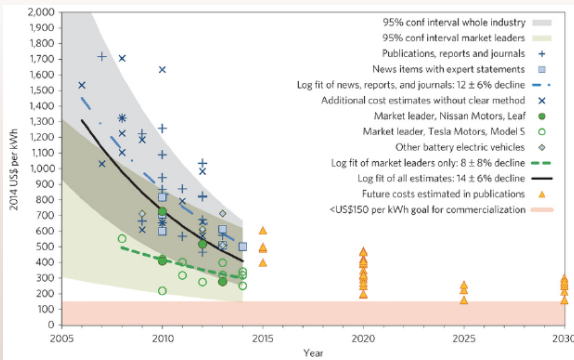


Figure 1 - Cost of Li-ion battery packs - Source Nature Climate Change



Source: Bloomberg New Energy Finance

• But...

13 Source: Smart Grid Forum presentation at IM review Forum

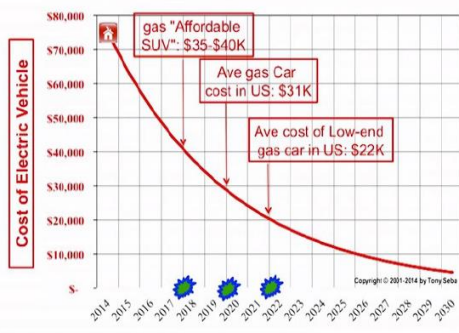
Problem validation - evidence (II)



Electric vehicles

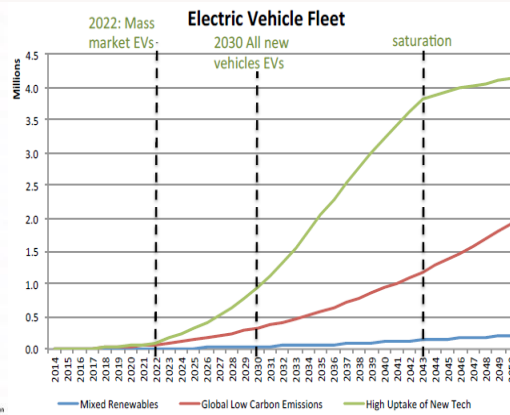
- ... same forces affecting EV cost, performance and uptake (increasing network's need)

Projected Cost of EV with 200-mile range



Assumptions - 4 miles/kWh, 50kWh batteries, 16% yearly improvement in battery costs, EV Costs = 3X cost of battery. Source: Clean Disruption

Source: Smart Grid Forum presentation at IM review Forum

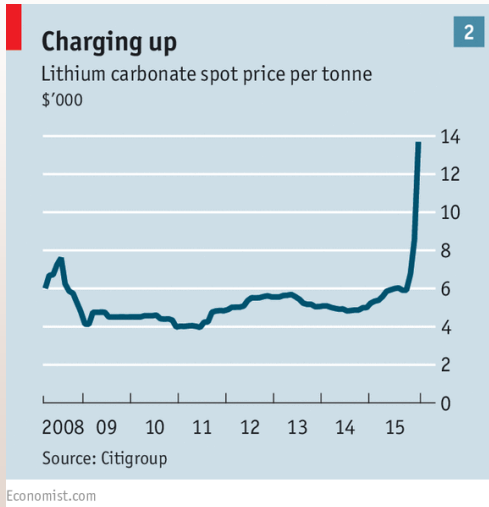


Source: Smart Grid Forum submission to MBIE's EDGS

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Problem validation - evidence (III)

Lithium price



- Higher prices of lithium carbonate. Significant due to magnitude of spike and because commodity prices are mostly falling
- Mainly demand driven
- Signals ramping-up of battery production
 - economies of scale
 - lower battery costs

15 Source: The economist (16 Jan 2016): "An increasingly precious metal".

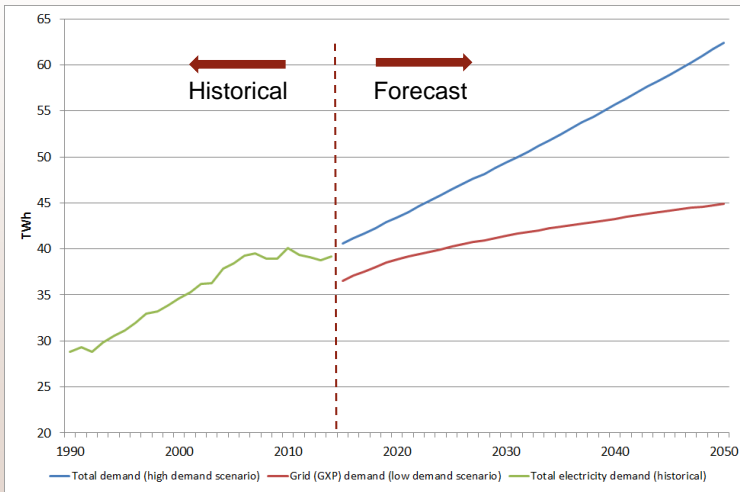
Problem validation - evidence (IV)



- However, market does not seem to anticipate risk eventuating materially in NZ. Otherwise, all other things being equal, we would expect to see some or all of:
 1. Lower demand (including forecasts) for grid-sourced electricity
 2. Lower wholesale electricity prices (including futures and forecasts)
 3. Lower share prices for electricity generation companies
 4. Lower CAPEX by EDBs

16

Problem validation - evidence (V) Electricity demand



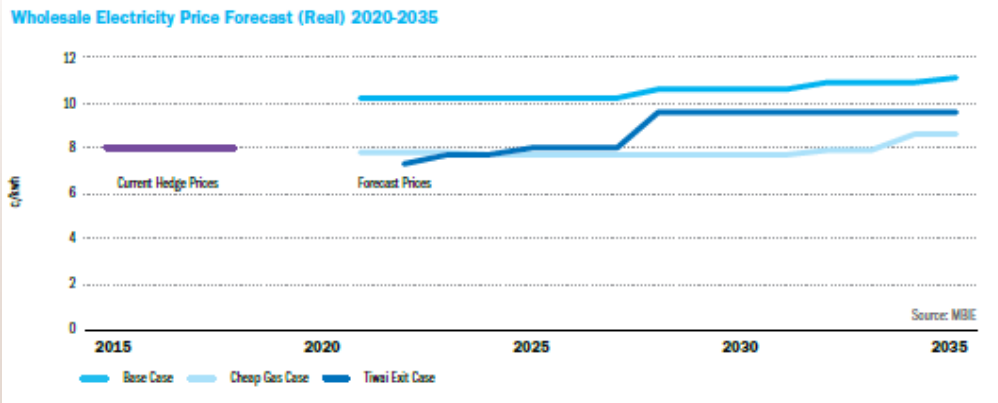
Grid-sourced electricity demand forecast to continue growing even in lowest grid demand scenario

17 Source: MBIE (EDGS) and MBIE energy statistics

Problem validation - evidence (VI) Wholesale electricity prices

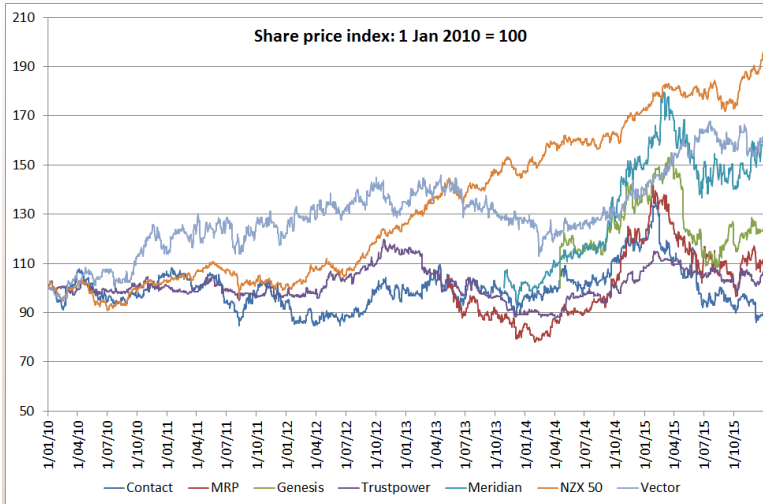


- Prices gently rising
 - 7-8 c/kWh average spot prices
 - 8 c//kWh hedge prices
 - 8-11 c/kWh forecast prices



18 Source: Infratil's December 2015 update, MBIE data

Problem validation - evidence (VII) Share prices

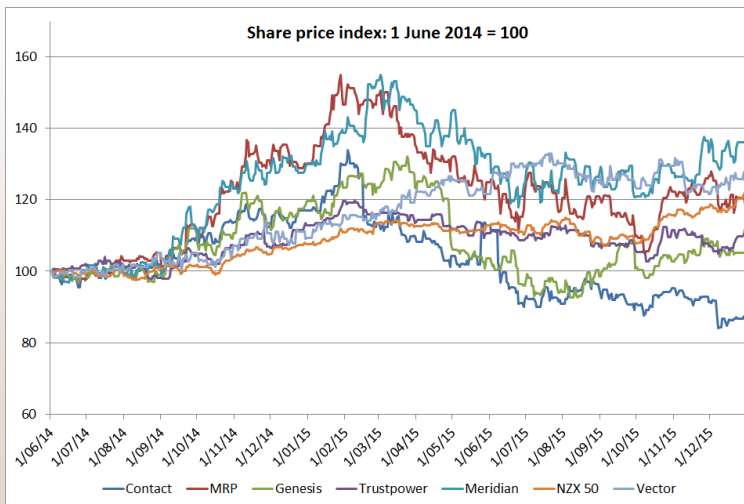


Share prices for gentailers and Vector up 10-60% in 2010-2015 (except Contact)

Underperforming market in 2010-2015

19 Source: Bloomberg

Problem validation - evidence (VIII) Share prices



Share prices for gentailers and Vector up 6-37% in last 18 months (except Contact)

Market up 22%

20 Source: Bloomberg

Attachment B: Cost allocation IM materiality threshold analysis

Purpose of this attachment

205. This attachment presents the analysis supporting our proposed change to the cost allocation IM materiality thresholds which is discussed in Chapter 4.

Materiality threshold analysis

206. The regulated revenue materiality threshold was set as part of the cost allocation IM in 2010 at 20% to ensure consistency with the two other thresholds, which are the operating cost and asset value materiality screening thresholds. This was based on analysis that suggested that the 20% threshold, in combination with the other thresholds, would prevent regulated suppliers who would receive more than a 2% increase to their total revenue from regulated services from using the ACAM approach on the basis of the revenue materiality threshold.¹³³
207. We have sought to replicate the analysis contained in Appendix C of the 2010 EDBs/GPBs Reasons Paper, which supported the level at which the materiality thresholds were set. The result of our analysis is presented in Table B1. Consistent with our decisions in 2010, the analysis focusses on EDBs (not GPBs). The EDBs are ordered from the highest to lowest percentage of unregulated revenue to total regulated revenue (ie, the total revenue from the provision of all regulated services, and not just the regulated revenue from supplying electricity distribution services).¹³⁴ As in 2010, we propose treating GPBs the same as EDBs for the purposes of the draft IMs, but we are open to doing further analysis if we receive feedback that suggests the proposed changes are not appropriate for GPBs.
208. Table B1 does not include all EDBs or GTBs, as some of the data on unregulated revenues for some EDBs was not robust.¹³⁵ Further, in light of the fact that AVnDA are very low for EDBs subject to price-quality regulation, we focussed on operating costs.
209. We then calculated the impact on revenue of using ACAM to report operating costs. This data shows the percentage impact on total regulated revenue of applying ACAM to OCnDA under two different assumptions. The first (2010 Revenue Split) is a replication of our 2010 analysis based on the historical industry-wide revenue split (67% regulated, 33% unregulated) that was used in the 2010 Reasons Paper. The

¹³³ Commerce Commission “Input methodologies (electricity distribution and gas pipeline services) reasons paper” (22 December 2010), para B3.16.

¹³⁴ As noted above, where a regulated supplier provides more than one type of regulated service (eg, both electricity distribution and gas distribution services, the allocation across all regulated services must be no higher than the allocation resulting from ACAM applied to those services in aggregate (Commerce Commission “Input methodologies (electricity distribution and gas pipeline services) reasons paper” (22 December 2010), para B5.3).

¹³⁵ Some examples of these data issues included: (1) that we could not determine total revenue because the number was not in the public domain and (2) that there was a clear data entry issue in some of the disclosures.

second (Current Revenue Split) applies the 2010 Reasons Paper's approach but uses the current industry split (61% regulated, 39% unregulated).

210. Based on this analysis, we have found that there is one case (highlighted in red) where a company subject to price regulation may be using ACAM even though they are expected to receive a greater than 2% impact on their reported regulated revenue. There are also two cases where companies not subject to price regulation are using the ACAM approach where it is expected to have a greater than 2% impact on their reported regulated revenue. If we cut the threshold to 10%, we can prevent a situation where a regulated supplier can make a significant windfall gain from using ACAM, while minimising the impact on small regulated suppliers.

Table B1: Revenue materiality threshold analysis

EDB	Used ACAM for OC?	Used ACAM for AV?	Total Revenue (000)*	Regulated Revenue (000)**	Unregulated Revenue (000)***	Unregulated/Regulated Revenue	OCDA (000)**	OCnDA (000)**	Operating Cost Threshold	ABDA (000)**	AVnDA (000)**	Asset Value Threshold	Price Regulated Business?	Operating Cost Impact on Revenue (2010 Revenue Split)	Operating Cost Impact on Revenue (Current Revenue Split)
Nelson Electricity			\$44,412	\$10,534	\$33,878	321.6%	\$1,905	\$0	0.00%	\$41,669	\$0	0.00%	✓	0.00%	0.00%
Northpower		✓	\$253,322	\$63,779	\$189,543	297.2%	\$13,762	\$13,588	49.68%	\$238,036	\$4,163	1.72%		7.03%	8.31%
Marlborough Lines			\$136,182	\$35,331	\$100,851	285.4%	\$11,521	\$965	7.73%	\$217,515	\$0	0.00%		0.90%	1.07%
Horizon Energy			\$112,250	\$31,893	\$80,357	252.0%	\$5,312	\$4,339	44.96%	\$109,634	\$3,649	3.22%	✓	4.49%	5.31%
Scanpower		✓	\$18,552	\$8,492	\$10,060	118.5%	\$1,599	\$1,418	47.01%	\$35,881	\$0	0.00%		5.51%	6.51%
Vector Lines		✓	\$1,294,016	\$616,862	\$677,154	109.8%	\$77,948	\$56,245	41.91%	\$2,638,112	\$28,641	1.07%	✓	3.01%	3.56%
Network Waitaki			\$26,903	\$16,754	\$10,149	60.6%	\$3,503	\$1,303	27.11%	\$73,574	\$877	1.18%		2.57%	3.03%
Top Energy		✓	\$61,097	\$39,133	\$21,964	56.1%	\$12,239	\$5,224	29.92%	\$212,096	\$4,625	2.13%	✓	4.41%	5.21%
Buller Electricity	✓	✓	\$9,915	\$7,692	\$2,223	28.9%	\$2,718	\$380	12.27%	\$26,000	\$2,540	8.90%		1.63%	1.93%
Waipa Networks	✓	✓	\$29,465	\$22,993	\$6,472	28.1%	\$4,811	\$769	13.77%	\$89,710	\$6,437	6.69%		1.10%	1.30%
The Lines Company			\$49,139	\$38,456	\$10,683	27.8%	\$8,079	\$3,203	28.39%	\$175,881	\$1,672	0.94%	✓	2.75%	3.25%
Alpine Energy	✓	✓	\$63,749	\$50,913	\$12,836	25.2%	\$13,822	\$0	0.00%	\$166,321	\$0	0.00%	✓	0.00%	0.00%
Powerco			\$445,900	\$358,774	\$87,126	24.3%	\$41,630	\$29,111	41.15%	\$1,454,598	\$27,164	1.83%	✓	2.68%	3.16%
Orion NZ			\$332,894	\$274,174	\$58,720	21.4%	\$50,828	\$0	0.00%	\$907,756	\$0	0.00%	✓	0.00%	0.00%
Electricity Ashburton	✓		\$46,831	\$41,252	\$5,579	13.5%	\$9,121	\$0	0.00%	\$226,349	\$0	0.00%	✓	0.00%	0.00%
Counties Power	✓	✓	\$52,305	\$46,467	\$5,838	12.6%	\$7,716	\$4,125	34.84%	\$227,781	\$228,905	50.12%		2.93%	3.46%
Westpower			\$23,335	\$20,833	\$2,502	12.0%	\$9,567	\$0	0.00%	\$112,420	\$0	0.00%		0.00%	0.00%
Unison Networks	✓		\$153,986	\$139,744	\$14,242	10.2%	\$19,314	\$17,715	47.84%	\$538,909	\$0	0.00%	✓	4.18%	4.94%

WEL Networks	✓	✓	\$110,079	\$100,990	\$9,089	9.0%	\$11,052	\$8,920	44.66%	\$482,546	\$0	0.00%		2.91%	3.44%
Centralines	✓		\$13,369	\$12,304	\$1,065	8.7%	\$3,477	\$94	2.63%	\$54,680	\$0	0.00%	✓	0.25%	0.30%
The Power Company			\$60,974	\$56,622	\$4,352	7.7%	\$14,414	\$0	0.00%	\$325,146	\$0	0.00%		0.00%	0.00%
Aurora Energy	✓	✓	\$99,453	\$93,463	\$5,990	6.4%	\$23,608	\$0	0.00%	\$330,597	\$0	0.00%	✓	0.00%	0.00%
Network Tasman	✓	✓	\$44,412	\$42,074	\$2,338	5.6%	\$9,818	\$0	0.00%	\$161,343	\$14,304	8.14%	✓	0.00%	0.00%

Notes: * Based on the relevant 2015 Annual Report, ** Based on March 2015 Information Disclosure data, *** Calculated as the difference of total revenue minus regulated revenue. The table does not include all EDBs or GTBs, as some of the data on unregulated revenues for some EDBs was not robust.

Key
Under the Revenue Materiality Threshold
Under the Operating Cost/Asset Value Materiality Threshold
Using ACAM where this has greater than a 2% impact on regulated revenues