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Input methodologies review decisions

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

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Associated documents

Publication date	Reference	Title
20 December 2016	978-1-869455-43-9	Input methodologies review decisions: Summary paper
20 December 2016	978-1-869455-44-6	Input methodologies review decisions: Introduction and process paper
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20 December 2016	978-1-869455-45-3	Input methodologies review decisions: Topic paper 1 – Form of control and RAB indexation for EDBs, GPBs and Transpower
20 December 2016	978-1-869455-46-0	Input methodologies review decisions: Topic paper 2 – CPP requirements
20 December 2016	978-1-869455-48-4	Input methodologies review decisions: Topic paper 4 – Cost of capital issues
20 December 2016	978-1-869455-49-1	Input methodologies review decisions: Topic paper 5 – Airports profitability assessment
20 December 2016	978-1-869455-50-7	Input methodologies review decisions: Topic paper 6 – WACC percentile for airports
20 December 2016	978-1-869455-51-4	Input methodologies review decisions: Report on the IM review
20 December 2016	1178-2560	*Electricity Distribution Services Input Methodologies Amendments Determination 2016* [2016] NZCC 24
20 December 2016	1178-2560	*Gas Distribution Services Input Methodologies Amendments Determination 2016* [2016] NZCC 25
20 December 2016	1178-2560	*Gas Transmission Services Input Methodologies Amendments Determination 2016* [2016] NZCC 26
20 December 2016	1178-2560	*Transpower Input Methodologies Amendments Determination 2016* [2016] NZCC 27
20 December 2016	1178-2560	*Airport Services Input Methodologies Amendments Determination 2016* [2016] NZCC 28
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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 (**IM**s);

X1.2 explain in relation to the emerging technology topic:

X1.2.1 the problems we identified within this topic area;

X1.2.2 our assessment of potential solutions to these problems; and

X1.2.3 the reasons for our chosen solutions; and

X1.3 explain how we have taken stakeholders' submissions into account in considering the above and in deciding on our solutions to problems identified within this topic.

X2. All of the solutions and changes to IMs described within this paper apply to electricity distribution businesses (**EDB**s).

X3. This paper may also be of particular interest to:

X3.1 gas pipeline businesses (**GPB**s), as the changes to the cost allocation IM presented in Chapter 4 (Regulatory treatment of revenues and costs from emerging technologies) also apply to them;

X3.2 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

X3.3 other parties interested in emerging technologies, such as Ministry of Business, Innovation and Employment (**MBIE**), Electricity Authority, Transpower, 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 spaces currently occupied by EDBs, electricity retailers and generators), 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 consider that fundamental 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, if it has, 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. Therefore, as a precautionary measure, we have decided to allow EDBs to recover the cost of assets more quickly. In particular, we will offer EDBs the option to apply for a net present value (**NPV**) neutral shortening of their remaining asset lives. This is capped at a 15% reduction in remaining average asset lives as compared to the situation at the time of the default price-quality path (**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 greater confidence to invest as well as avoiding subsequent "regulatory catch up", which could lead to large future price shocks.

X11. Some stakeholders (mainly electricity retailers) expressed significant concern with electricity distributors entering unregulated energy markets. Their key concern was 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, rules around industry structure generally lie outside the IMs. However, we have decided to remove the avoidable cost allocation methodology (**ACAM**) as a stand-alone cost allocation option for EDBs and GPBs to ensure that consumers of regulated services benefit over time from any efficiency gains achieved by EDBs and GPBs supplying regulated and unregulated services together.[1]

X13. Table X1 summarises the areas in this topic where our decisions have 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 to the IMs; these issues are also discussed in this paper.

[1] This is consistent with the s 52T(3) requirement that the IMs must not unduly deter investment by regulated suppliers in the provision of other services.

Table X1: Summary of changes in relation to this topic

Change	Outcomes of the change	Chapter
We have amended the IMs to allow EDBs, at the time of the DPP reset, to apply for a discretionary NPV-neutral shortening of their remaining asset lives. This is capped at a 15% reduction in remaining average asset lives as compared to the situation at the time of the DPP reset.	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. This change mitigates the risk of potential future price shocks for consumers, which would likely be required to maintain the expectation of *ex-ante* financial capital maintenance (**FCM**) if (and when) the downside risk of partial capital recovery becomes more likely.	This change is discussed in Chapter 3: Risk of partial capital recovery.
We have amended the IMs to remove ACAM as a stand-alone cost allocation option for EDBs or GPBs. Suppliers will continue to be able to allocate up to the ACAM level across all regulated services under OVABAA.	This change would 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)).	This change is discussed in Chapter 4: Regulatory treatment of revenues and costs from emerging technology.
We have strengthened the requirement in the IMs to make it clear that the use of proxy cost allocators must be justified when applying ABAA. We will also require additional information under information disclosure about why suppliers could not use a causal allocator and why their selected proxy allocator is appropriate.	This change will put more onus on suppliers to demonstrate that: • a causal relationship cannot be established; and • the proxy cost allocator selected is appropriate. We consider this better gives 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. The additional information required under information disclosure will help us assess whether the requirements need to be further tightened in future.	This change is discussed in Chapter 4: Regulatory treatment of revenues and costs from emerging technology.

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

X14.1 a summary paper of our decisions;

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

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

X14.4 a report on the IM review, which records our decisions on whether and how to change the IMs as a result of the IM review overall; and

X14.5 amendment determinations, which give effect to our decisions.

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, our role as economic regulator in that context, and the impacts of that emerging technology on the input methodologies (**IM**s);

    1.2 explain in relation to the emerging technology topic:

        1.2.1 the problems we identified within this topic area;

        1.2.2 our assessment of potential solutions to these problems; and

        1.2.3 the reasons for our chosen solutions; and

    1.3 explain how we have taken stakeholders' submissions into account in considering the above and in deciding on our solutions to problems identified within this topic.

Where this paper fits in to our package of decisions papers

2. This topic paper forms part of our package of 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 decisions package.[2]

3. This paper explains our solutions to problems identified within the topic of emerging technology.

4. To the extent our solutions involve changes to the IMs, this paper explains how we have changed our existing IM decisions within this topic area.[3] The Report on the IM review then collates our changes to the IMs and presents them as decisions to change the IMs.[4]

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2 Commerce Commission "Input methodologies review decisions: Introduction and process paper" (20 December 2016).

3 To the extent our 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).

4 Commerce Commission "Input methodologies review final decision: Report on the IM review" (20 December 2016).

5. The drafting changes to the IMs, including those resulting from this topic area, are shown in the amendment determinations, which we have published alongside this topic paper.[5]

6. The framework we applied in reaching our decisions on the IM review is set out in a separate paper, also published alongside this paper.[6] The framework paper explains that we have only changed the IMs where this is 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 have addressed 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.

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5 Electricity Distribution Services Input Methodologies Amendments Determination 2016 [2016] NZCC 24; Gas Distribution Services Input Methodologies Amendments Determination 2016 [2016] NZCC 25; and Gas Transmission Services Input Methodologies Amendments Determination 2016 [2016] NZCC 26.

6 Commerce Commission "Input methodologies review decisions: Framework for the IM review" (20 December 2016).

Introduction to this topic

10. In our problem definition paper,[7] we described our initial views on the future impact of emerging technologies in the energy sector topic.

11. 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.

12. The potential problem areas we considered within this topic are as follows:[8]

    12.1 risk of partial capital recovery – increasing deployment of emerging technologies potentially changes the risk to suppliers' ability to fully recover their invested capital;

    12.2 regulatory treatment of revenues and costs from emerging technologies (including cost allocation):

        12.2.1 use of the avoidable cost allocation methodology (**ACAM**) – materiality thresholds based on a percentage of revenue or costs are not necessarily appropriate, especially for suppliers with relatively large cost bases; and

        12.2.2 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

    12.3 efficient investment incentives:

        12.3.1 the benefits of investment in emerging technologies may not accrue until future regulatory periods;

        12.3.2 the benefits of investment in some emerging technologies are split along the value chain, which may result in under-investment; and

        12.3.3 incentives to innovate may need to be stronger.

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7 Commerce Commission "Input methodologies review invitation to contribute to problem definition" (16 June 2015).

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

Who do the solutions described within this paper apply to?

13. All of the solutions and changes to the IMs described within this paper apply to electricity distribution businesses (**EDB**s).

14. This paper may also be of particular interest to:[9]

    14.1 gas pipeline businesses (**GPB**s), as the changes to the cost allocation IM presented in Chapter 4 (Regulatory treatment of revenues and costs from emerging technologies) also apply to them;

    14.2 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

    14.3 other parties interested in emerging technologies, such as Ministry of Business, Innovation and Employment (**MBIE**), Electricity Authority, Transpower and consumer groups.

[9] 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.

Chapter 2: The changing energy landscape

Purpose of this chapter

15. This chapter provides the context for the specific problems we identified in this topic area and our solutions in response to those problems.

Structure of this chapter

16. 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?

17. 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.

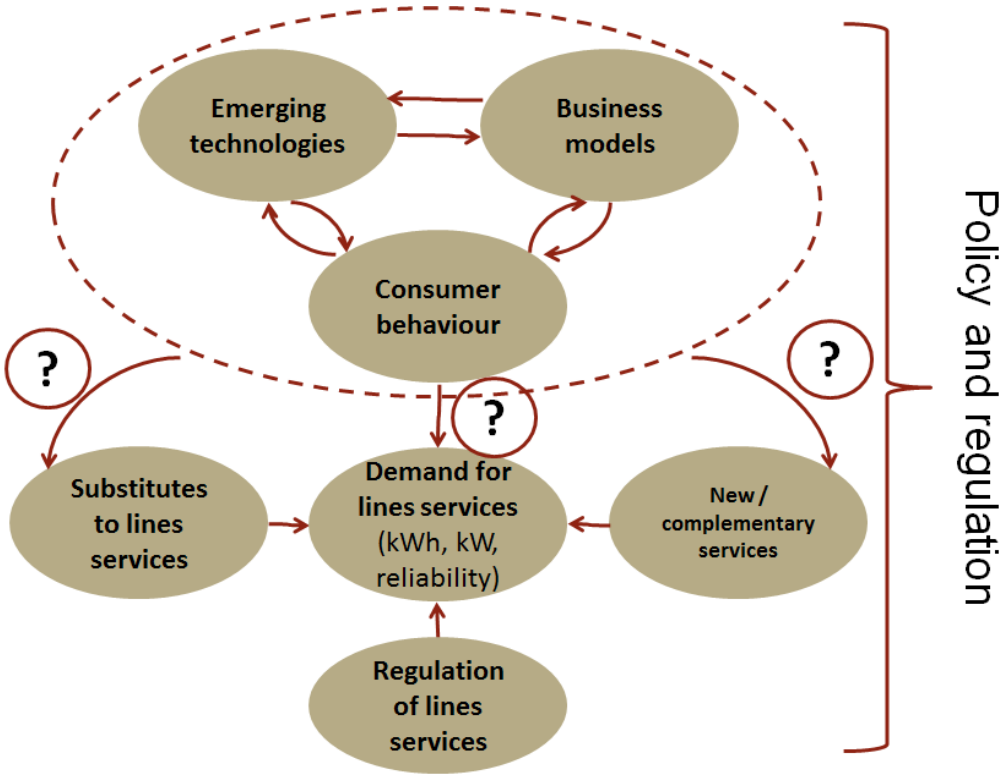
18. There is an exciting range of developing and emerging technologies which have the potential to shape the electricity networks of tomorrow. These technologies, variously described as emerging, evolving, developing, or edge technologies, include, for example, distributed and grid electricity storage, 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.[10] 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.

19. 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).

[10] MBIE's Smart Grid Forum defines a 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.

20. 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.

21. 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 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.[11] 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.[12]

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[11] 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.

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

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

22.1 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.[13]

22.2 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.[14]

What is changing; what is not?

23. There are a wide range of views about the evolving nature of the energy system and the potential impacts on electricity and gas networks.

24. 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.

25. 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 two 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).

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

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

26. 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 in the energy sector. Those representatives noted that the distribution network of the future will need:[15]

    26.1 to be consumer centric – providing energy choices and options to consumers;

    26.2 to facilitate customer and third party transactions (open access), supplementing with locally generated electricity, and providing supply reliability and resilience; and

    26.3 the network operator to ensure:

        26.3.1 the safe and reliable operation of the network;

        26.3.2 systems stability, power quality and adequacy of supply; and

        26.3.3 the integrity of network assets.

27. So what in the environment is changing? Below we present a selection of stakeholder views.

[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.

Stakeholders' views vary widely

28. 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.

    28.1 In its presentation to our stakeholder forum, the Smart Grid Forum identified four key changes for the providers of electricity lines services:[16]

        28.1.1 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;

        28.1.2 system instability from variable generation, leading to power quality issues, and potential frequency excursions;[17]

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

        28.1.4 a need to better understand consumers and the differences between consumers.[18]

    28.2 The 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.[19]

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16 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.

17 A frequency excursion is a temporary deviation of frequency from the normal operating frequency of the power system due to a mismatch between electricity generation and demand.

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

19 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.

28.3 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.
>
> 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.[20]

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

29.1 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".[21]

[20] Vector's submission "Input methodologies review – Invitation to contribute to problem definition" (21 August 2015), p. 4.

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

29.2 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.[22]

29.3 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.[23]

29.4 Genesis also considered that the changes emerging technologies will bring to the energy sector could be significant:

> Genesis Energy believes the traditional vertical relationship focussed on the supply of electrons to the end consumer will become outdated and be replaced with a market where end consumers will purchase multiple products and services that suit their individual needs - changing and shaping the way they receive and consume energy. Proliferation in the highly competitive "beyond-the-meter" market is likely to also create new pressures from new, non-traditional players as diverse as product retailers to telecommunications companies. The shift to a consumer-centric energy eco-system, while maintaining the security, reliability and supply of energy the sector is expected to deliver, will be challenging for all, but stalling roadblocks to advancement are not the answer.[24]

30. 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:

30.1 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.[25]

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

23 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.

24 Genesis "Input methodologies review draft decisions – Topic paper 3: The future impact of emerging technologies in the energy sector" (4 August 2016), p. 2.

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

30.2 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.[26]

30.3 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.[27]

31. 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:

31.1 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.[28]

31.2 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.[29]

32. Some consider that the impact is imminent. For example:

32.1 SEANZ submitted:

> The prevalent view is that these consumer-led technologies represent massive imminent disruption to the existing supply industry business models.[30]

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

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

28 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.

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

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

32.2 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.[31]

33. 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.

33.1 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.[32]

33.2 Powerco considered:

> Emerging technologies have the potential to have a dramatic impact on the sector in the future, and it may be that when those impacts are known the IMs will require amendment. However the nature of the impacts and their timing is currently quite unclear. It would be inappropriate to make substantial amendments to the IMs in this review cycle. Rather, the emphasis should be on understanding the issues and monitoring developments.[33]

33.3 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.[34]

34. Some submitters considered further reviews of either the IMs or the wider regulatory framework are needed to address the impacts of emerging technologies. For example:

34.1 Powerco suggested that, rather than waiting another seven years for the next IM review, we should undertake a mid-period review on the impact of emerging technologies.[35]

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

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

33 Powerco "Submission on input methodologies review – Draft decisions" (4 August 2016), para 259.

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

35 See, for example, Powerco "Submission on input methodologies review – Draft decisions" (4 August 2016), para 283.

34.2 MEUG considered a refresh of Part 4 and the regulatory framework should be considered within the next four to five years.[36]

34.3 Molly Melhuish suggested that the legal basis of the 'purposes' of energy regulation needs a complete overhaul to protect the interests of domestic consumers, and to re-emphasise the need to also protect the planet's climate.[37]

34.4 Genesis suggested that the Commission, Electricity Authority and MBIE should be jointly leading industry discussions on facilitating emerging technology ('e-tech') in competitive markets. Genesis noted a decision on e-tech does not need to be reached this year, and it should be separated out from the IM review to consider the future integration of e-tech into the regulatory framework.[38]

34.5 Electricity Retailers' Association of New Zealand (**ERANZ**) also considered a more co-ordinated approach is needed from the respective policy and regulatory bodies, and suggested the Commission should commit to undertaking a review of market developments within the next two or three years.[39]

The Commission's perspective

35. 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.

36. The two key areas we identified are:

36.1 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

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36 MEUG "Submission on Input methodologies draft review decisions" (4 August 2016), para 10.

37 Molly Melhuish submission on IM review draft decisions papers "Commentary on letters from Electricity Authority to Commerce Commission dated 30 May 2016 (form of control) https://www.ea.govt.nz/dmsdocument/20784 and 1 June 2016 (on treatment of cash flows, emerging technology) https://www.comcom.govt.nz/dmsdocument/14337"(4 August 2016), p. 1.

38 Genesis "Input methodologies review draft decisions – Topic paper 3: The future impact of emerging technologies in the energy sector" (4 August 2016), p. 4.

39 ERANZ "Submission to the Commerce Commission on input methodologies for emerging technology" (4 August 2016), para 158.

36.2 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.

37. As mentioned above, although some aspects of the environment in which the IMs were set are changing, our purpose remains the same.

38. We discuss this in more detail below.

Our role as economic regulator

39. 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:

39.1 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.

39.2 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.

40. In order to progress the above areas, we purposely 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.

41. In 2015 we published two papers,[40] held an open forum,[41] and an industry workshop.[42] We also engaged publicly and bilaterally with several key stakeholders, including the Electricity Authority, MBIE, the Treasury and the Smart Grid Forum.[43] We received a wide range of submissions and cross submissions on our draft decision on this topic published in June 2016,[44] and also on our updated draft decision on cost allocation published in September 2016.[45]

42. We have found the process to be valuable and consider that we have made good progress in the two areas.

    42.1 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.

[40] 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).

[41] See: http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/input-methodologies-review/input-methodologies-review-forum-2/.

[42] See: http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/input-methodologies-review/emerging-technology/.

[43] 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).

[44] Commerce Commission "Input methodologies review draft decisions: Topic paper 3 – The future impact of emerging technologies in the energy sector" (16 June 2016).

[45] Commerce Commission "Input methodologies review: Updated draft decision on cost allocation for electricity distribution and gas pipeline businesses" (22 September 2016).

42.2 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, ERANZ,[46] SEANZ,[47] John Irving,[48] Molly Melhuish,[49] Bryan Leyland,[50] 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.[51]

43. We find it useful to emphasise the following two key points that have been raised through this process.

43.1 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.

43.2 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 areas include:

43.2.1 Distribution pricing: EDBs make 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;

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

47 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).

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

49 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).

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

51 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 p. 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;jsessionid=667526C0D48D00A296A227E23D2AAA0A).

43.2.2 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.[52] Parliament has ultimate decision-making power should more fundamental changes to industry structure be deemed appropriate; and

43.2.3 Boundaries of regulation and competition: more fundamentally, if new technologies erode the natural monopolistic characteristics of electricity lines services (or gas pipeline services),[53] 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.

44. 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.[54] It does this through market design, overseeing market operations, and monitoring and enforcing compliance with market rules.[55]

45. 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. MBIE is taking the lead on this topic from a policy perspective.

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52 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).

53 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 (GQDN). 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.

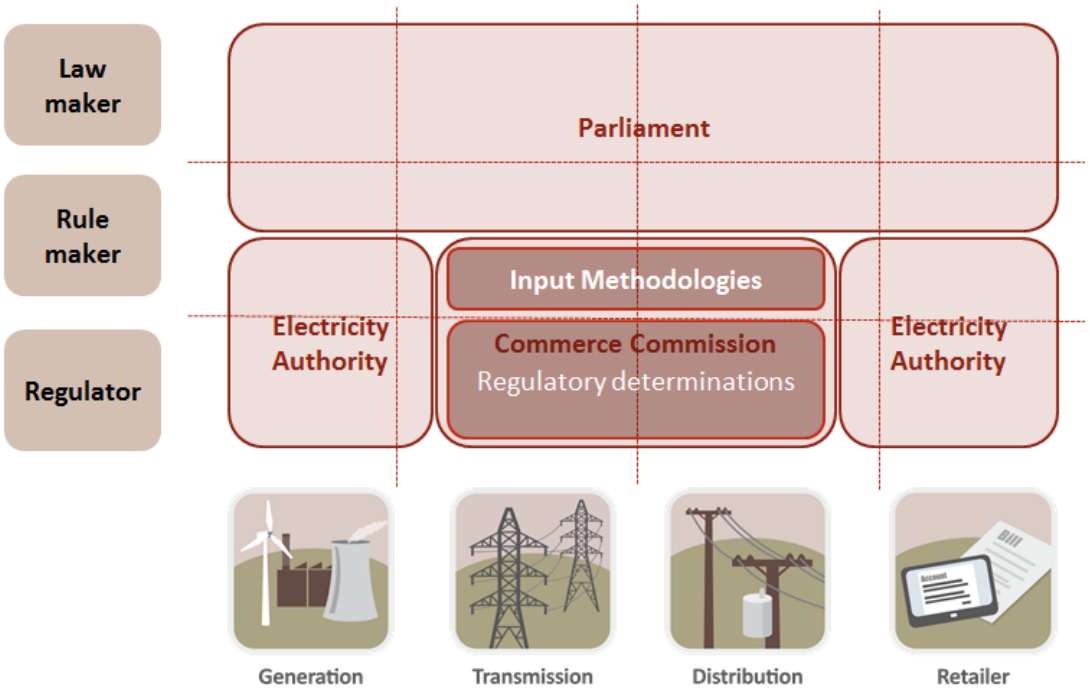
54 See: http://www.ea.govt.nz/.

55 See: http://www.comcom.govt.nz/dmsdocument/9673.

46. As well as supporting and participating in MBIE's cross-agency discussions, we intend to monitor the rate of deployment of new technologies, how they are used, and the impacts they are having. We will continue to collaborate with the Electricity Authority regarding the challenges and opportunities we face as regulators in this changing environment, and will support the Electricity Authority as it seeks to promote competition in the electricity industry, including in markets affected by emerging technologies. As we noted in our framework for the IM review, we consider that significant changes outside the seven-year review cycle may be required at some stage and we are open to re-looking at the IMs if circumstances change.[56]

47. 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.

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



The role of the IMs in the emerging technology context

48. 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.

49. In considering changes to the IMs, we also want to future-proof them to the extent possible, given the information available to us today.

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[56] Commerce Commission "Input methodologies review decisions: Framework for the IM review" (20 December 2016), para 53.

50. 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.

51. Regarding the relatively narrow remit of the IMs, we have identified the following key areas of focus for the IM review:

    51.1 risk of partial capital recovery (Chapter 3);

    51.2 regulatory treatment of revenues and costs associated with emerging technology (Chapter 4); and

    51.3 efficient investment incentives (discussed below).

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

Efficient investment incentives

53. Regarding incentives for EDBs to efficiently invest in emerging technologies, submitters raised the following three issues:

    53.1 that the benefits of investment in emerging technologies may not accrue until future regulatory periods;

    53.2 that the benefits of investment in some emerging technologies are split along the value chain, which may result in under-investment; and

    53.3 that incentives to innovate may need to be stronger.

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

54. 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.[57] 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.

55. We consider that this point is a general one, not specific to emerging technologies, and we are not convinced EDBs lack sufficient incentives to invest. We generally plan to set an efficient expenditure allowance, which should be adequate on average and allow an expectation of a normal return.[58] We expect EDBs to make trade-offs on the timing of expenditure within that allowance, and the incremental rolling incentive scheme (**IRIS**) neutralises any incentive to inefficiently delay any efficiency-enhancing expenditure. Investments that reduce costs relative to allowances are rewarded.[59] Furthermore, regardless of whether any investment fails or succeeds in delivering the anticipated benefits, their capital costs are added to the regulatory asset base (**RAB**) and start earning the weighted average cost of capital (**WACC**) from subsequent regulatory periods.

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

56. This concern is that EDBs may not make certain investments that are in the long-term interest of consumers.[60] 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.

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57 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.

58 EDBs would not be penalised for incurring the up-front costs, provided the efficiency enhancing expenditure is forecast at the start of the period.

59 Under a DPP for EDBs, the allowance for opex is currently based on an extrapolation of historic levels of operating expenditure. Therefore, provided this approach continues in the future, EDBs will be rewarded for efficiency gains, irrespective of whether they occur in this period or future periods.

60 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), p. 6-7.

57. We acknowledge that there may be transaction costs associated with coordination and contracting between parties. [61] 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 do not consider that this issue warrants regulatory intervention.

Incentives to innovate should be stronger

58. Several submitters suggested that the IMs should include specific incentives for EDBs to invest in research and development in relation to emerging technologies.[62]

59. Some also noted that there is a natural incentive for EDBs to favour investment in known technologies.[63]

60. The Smart Grid Forum submitted that "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".[64]

61. On the other hand, MEUG considered the IMs should not provide explicit incentives for innovation, and noted EDBs have the option to apply for a CPP if they have particular innovation investment issues.[65]

62. We consider that our regime places adequate incentives on EDBs to innovate.

    62.1 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).

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61 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.

62 For example: Orion "Submission on emerging technology and the IM review" (4 February 2016), para 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.

63 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.

64 Smart Grid Forum "Emerging technology pre-workshop paper" (29 January 2016), p. 4.

65 MEUG "Submission on Input methodologies draft review decisions" (4 August 2016), para 22-23.

62.2 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**).[66] 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.

63. We are not convinced that 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.

64. However, we note that the government does have a contestable fund for research and development (**R&D**) into which EDBs can bid to get innovation funding.[67] We consider that it may be inefficient to replicate the systems and processes needed to administer another funding scheme.

65. 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.

[66] 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.

[67] See: http://www.callaghaninnovation.govt.nz/grants.

66. 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.[68]

66.1 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.

66.2 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.

66.3 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.

66.4 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.

66.5 The benefits of WEL Network's smart meter programme.

66.6 Northpower's efforts to encourage the roll-out of electric vehicles including its own extensive electric vehicle charging network.

66.7 Powerco's Basepower initiative for remote regions which has been deployed to ten sites to date.

[68] 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.

66.8 EDBs continue to invest in, and innovate in, new technologies. For example, in October 2016 Vector commissioned Asia Pacific's first grid-scale Tesla Powerpack battery storage system to be integrated into a public electricity network. It is reported that Vector's $5m investment in this battery will avoid a conventional $12m upgrade to existing network infrastructure.[69]

[69] See: http://www.nzherald.co.nz/vector/news/article.cfm?c_id=1503810&objectid=11736123; and https://www.vector.co.nz/newsdisplay/Vector-unveils-Asia-Pacifics-first-grid-scale-Tesla-Powerpack.

Chapter 3: Risk of partial capital recovery

Purpose of this chapter

67. This chapter explains the risk of partial capital recovery problem and our solution to this problem.

Structure of this chapter

68. This chapter begins by defining the problem for EDBs and then setting out our chosen solution in respect of this problem. We address submissions on our chosen solution and explain, where relevant, why we have not adopted these. Finally, the chapter discusses implications for gas distribution businesses (**GDB**s) and whether there is a problem relating to risk of partial capital recovery for that sector.

Problem definition for electricity distribution businesses

69. This section explains the problem definition for EDBs, including how it evolved through comments from submissions.

70. 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:

    70.1 more consumers to generate and store their own electricity; and/or

    70.2 new competitors to enter the market and bypass distributors' networks.

71. 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 have assessed the potential change in this risk relative to what it was in 2010, when we first set the IMs.

72. The IMs allow for assets to stay in the RAB even though they have ceased to be used (ie, become physically stranded).[70] Therefore, physical asset stranding is not the risk under consideration. Rather, it is the risk that the network becomes economically stranded.[71] 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').[72] This is because prices to those remaining consumers would need to rise beyond their willingness to pay given their economic alternatives (or beyond politically acceptable levels).[73]

73. 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. EDBs not expecting to recover their return of and on capital would be inconsistent with our principle of *ex-ante* financial capital maintenance (**FCM**).[74]

74. In relation to the FCM principle, the ENA submitted that it:

> …does not believe it is acceptable that the Commission has raised the prospect of EDBs failing to fully recover their investments and suggesting that this would be acceptable if asset stranding reached a particular level. This is inconsistent with FCM=0 core economic principle and will not promote section 52A(1)(a).[75]

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

71 We note that the ENA questioned the distinction between "asset stranding" and "economic network stranding" (see: ENA "Input methodologies review – Impact of emerging technologies – Submission to the Commerce Commission" (4 August 2016), para 49-51). We consider that we and the ENA are in agreement on what this means, which is that if this risk materialises, EDBs may be "unable at a certain point in time to recover the costs of their investments", whether or not this is associated with widespread physical asset stranding.

72 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.

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

74 As discussed in our framework paper, released alongside this paper, the principle of real FCM means we provide regulated suppliers with 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 decisions: Framework for the IM review" (20 December 2016).

75 ENA "Input methodologies review – Impact of emerging technologies – Submission to the Commerce Commission" (4 August 2016), para 52.

75. Similarly, PwC submitted that:

> The distributors which support this submission are concerned by the comment in the consultation paper that distributors may ultimately fail to recover their investments in certain circumstances. Distributors have invested in their networks in the expectation of cost recovery and if this is not forthcoming, or is not supported by the regulator, future investment incentives will be affected. The Commission's statement appears inconsistent with the Part 4 Purpose and the Commission's FCM principle.[76]

76. We consider that our discussion of the risk of partial capital recovery, and our chosen risk mitigation solution, are consistent with the FCM principle. Our approach to the FCM principle is explained in the framework paper:[77]

> 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 in promoting 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.

77. 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.

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[76] PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers" (4 August 2016), para 207-208.

[77] Commerce Commission "Input methodologies review decisions: Framework for the IM review" (20 December 2016), para 151-152.

78. This risk, which is linked to the potential for disconnections, is probably asymmetric for EDBs' regulated business.[78] This is because regulation limits EDBs' ability to grow revenue beyond forecast (especially so under a revenue cap), which constrains the upside to returns.[79] 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 97 to 101 below, where growing connections under a weighted average price cap could result in increased revenue, and potentially higher returns within the regulatory period.

79. 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:

    79.1 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;[80] and

    79.2 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.[81]

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78 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.

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

80 Although we note that this may be an offsetting upside (ie, increased EDB profits) to the extent that they are more economic alternatives to traditional 'poles and wires', since EDBs are currently allowed to invest in these emerging technology assets (or contract for their services) in order to deliver electricity lines services.

81 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).

80. We consider that the available evidence is inconclusive on whether the risk of partial capital recovery for EDBs' regulated business has increased and, if so, 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 presented the main elements of the analysis that supports this conclusion in Attachment A of the draft topic paper.[82]

81. 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.

82. 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.

Solution for this problem

83. This section describes our chosen 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 solution

84. We have decided to implement 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.

85. This adjustment will be capped at a 15% reduction in remaining average asset lives as compared to the situation at the time of the DPP reset.[83] EDBs may propose a smaller reduction, but the Commission has the final say over this quantum. We note that the IMs already allow EDBs to extend their asset lives.[84]

86. This solution changes our pre-review 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. These changes to the IMs will take effect at the next reset for EDBs.

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82 Commerce Commission "Input methodologies review draft decisions: Topic paper 3 – The future impact of emerging technologies in the energy sector" (16 June 2016), Attachment A.

83 The 15% reduction in remaining average asset lives allows EDBs to increase depreciation by more for some assets and less for others.

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

87. We present the details of this asset lives adjustment in the Report on the IM review.[85]

Reasons for preferring this solution

88. Our chosen 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 becomes more likely. In that sense, this is a precautionary measure consistent with the nature of the problem – one of increased uncertainty.[86] 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 life adjustments now would risk increasing the materiality of any potential future adjustment to asset lives, if the risk becomes 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.

89. At the same time, *ex-ante* our 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)).[87] 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)).

90. Based on the 2015-2020 DPP model, and all other things being 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.[88]

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85 See decision AV17 in the Report on the IM review: Commerce Commission "Input methodologies review final decision: Report on the IM review" (20 December 2016).

86 We note Contact's submission that "there is inconclusive evidence that the risk of partial capital recovery has increased as a result of emerging technology. The Commission's proposal for accelerated depreciation, therefore, lacks compelling reasoning, and is not reflective of the risks EDBs face" (see: Contact Energy submission on IM review draft decisions papers "Input methodology review" (4 August 2016), p. 2). We agree that it is unclear whether the risk has increased. That is why our solution is an NPV neutral measure that mitigates the impact to consumers should the risk eventuate, rather than compensating suppliers for bearing the risk.

87 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 solution makes this scenario less likely.

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

91. Because all other things are rarely equal, where an EDB applies an asset life adjustment prior to a DPP being set, 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).

92. Our 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, and have the strongest incentive, to manage this risk, for example through pricing (eg, to ensure uptake of solar PV is not inefficiently incentivised).[89] Our solution expands their ability to mitigate this risk. We would expect EDBs to act if they genuinely see this risk increasing.

93. Given the uncertainty associated with this risk, we are open to reassessing the regulatory settings in the future, should circumstances change materially. Our solution should clearly signal our continued adherence to the principle of *ex-ante* FCM.[90]

94. The ENA recommended that this solution be amended in a number of ways.[91] Here are the ENA's points and our responses.

    94.1 Removal of the 15% cap: we disagree. This is a precautionary and modest solution that is only aimed at partially mitigating the downside risk of network economic stranding, in the context of a DPP. We consider that bearing this risk places incentives on suppliers to improve the efficiency of their expenditure (eg, in certain circumstances, an opex solution may be superior to committing capital to a 40-year asset). Removing the cap risks undermining those incentives to the extent that suppliers perceive that recovering sunk costs quicker will be considerably easier or more likely. Furthermore, the level of evidence that we will likely require to assess an application to shorten assets by significantly more than 15% will be higher. This goes against ENA's view that the level of evidence required should be "relatively low if the option is to be meaningful and useful". It also risks undermining the 'low cost' nature of DPPs. Finally, if a supplier considers that the risk of network stranding it faces is significantly higher, we can consider alternative depreciation profiles under a CPP.

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89 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.

90 Commerce Commission "Input methodologies review decisions: Framework for the IM review" (20 December 2016), para 117.1.

91 ENA "Input methodologies review – Impact of emerging technologies – Submission to the Commerce Commission" (4 August 2016), para 40-45.

94.2 Publication of guidance on how the Commission will assess applications for asset life shortening: we are open to this in advance of the next EDB DPP reset.

94.3 Extend option to all EDBs, exempt and non-exempt: we have directed the mechanism to non-exempt EDBs because they are subject to a price-quality path: this potentially allows non-exempt EDBs to advance cash-flows – which they otherwise could not do – but it also requires them under information disclosure to disclose a RAB consistent with the way cash-flows have been advanced. That ensures that our *ex-post* profitability assessment can be undertaken on a consistent basis. Exempt EDBs are not price-quality constrained, so they can advance cash-flows if they want already. Exempt EDBs can always disclose additional information in their disclosures (eg, if they want to advance cash-flows), and can always explain in their disclosures how and why they are doing that and what effect it might have on the RAB.

94.4 Allow suppliers to apply for this option more than once: there will be another IM review prior to the 2025 reset for EDBs, so this is something we can consider then, if needed. Also, it is possible to review the IMs part-way through the 7-year cycle, and we remain open to doing so if the need arises.

95. In addition, the ENA recommended that the IMs specify a reduced life of 25 years for all new assets on the basis that the risk of "partial asset recovery" is particularly large for new assets. We do not consider this to be a proportionate solution to the problem. We reject this recommendation for similar reasons to those set out above – shortening asset lives to 25 years for all new assets risks undermining efficient expenditure incentives to the extent that suppliers perceive that recovering sunk costs quicker will be considerably easier or more likely. We note that our solution is not asset specific, but rather provides the option of shortening *average* remaining asset lives. Any potential stranding risk that suppliers perceive for any of their assets, new or old, can be partially mitigated under our chosen solution, or the more encompassing CPP option.

Implications for gas distribution businesses

96. This section discusses implications of emerging technology for GDBs and 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

97. Some stakeholders have highlighted the risk of asset stranding for gas networks, mainly in the context of 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.

98. This risk of partial capital recovery is mainly driven by:

98.1 the somewhat more 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;

98.2 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;

98.3 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.[92] 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;

98.4 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;[93]

98.5 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

98.6 the higher cost of safety regulations for gas is another factor that may discourage gas use.

99. On the other hand, GDBs also have the ability and incentive to grow connections in any given regulatory period (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.[94] This may make the risk facing GDBs less asymmetric than for EDBs.

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92 CEG "Relative risk of gas transport services: A report for Vector" (March 2016), p. 3-6.

93 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.

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

100. However, like EDBs, it is not clear to us whether the risk of partial capital recovery has materially increased for GDBs since 2010 when we set the IMs. In our draft decision, we indicated that we were also open to an optional shortening of asset lives for GDBs as a way of partially mitigating the risk of partial capital recovery, if this risk has increased for GDBs (backed by evidence).[95]

101. First Gas suggested it would be prudent to apply the asset shortening option to gas networks:

> We note that the IMs being amended now will not only be used for setting gas DPPs from 2017 to 2022, but likely for those from 2022 to 2027 as well. Within that time frame we cannot rule out a potential impact of emerging technologies on GPBs. Therefore, it would be prudent to provide the same option to GPBs as is being provided to EDBs.[96]

102. On the other hand, Oxera argued against it:

> The Commission has considered whether to allow gas pipeline businesses the option of shortening asset lives to mitigate stranding risk. However, as gas networks are still growing, the burden on each consumer of shortening asset lives to permit accelerated recovery of sunk investment costs would be high. The regulated asset base (RAB) of gas pipeline businesses per connection point is NZ$7,720, compared with NZ$4,384 for electricity networks. This suggests that attempting to recover the RAB over a shorter period of time would imply a disproportionate increase in gas tariffs (relative to electricity tariffs). An increase in gas tariffs might deter future connections growth and/or hamper gas networks' ability to price up to their cap if customers perceive the tariff increase to be untenable and switch off their gas connection.[97]

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95 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.

96 First Gas "Submission on Input methodologies review draft decisions (excluding cost of capital)" (4 August 2016), p. 2.

97 Oxera "Asset beta for gas pipelines in New Zealand. Final report: Prepared for First Gas" (3 August 2016), p. 37-38.

103. Likewise, MGUG, Methanex and Oji Fibre considered that the asset shortening option should not be extended to gas networks:

> MGUG disagrees with First Gas on this matter for two reasons. Firstly the Commission was open to considering asset lives for GDBs only on the basis that any increased risk of stranding was backed by evidence8. Since there is no evidence MGUG can't see a basis for changing the Commission's draft decision on this topic. Secondly the Commission only opened this up for GDBs, not GTBs, so by suggesting that the option should be there for GPBs First Gas has gone beyond the Commission's scope for the issue.
>
> We question the general principle of reducing asset lives in response to a conceptual future risk of asset stranding – such outcomes are not consistent with workably competitive markets. In any case, even if such treatment is considered appropriate for EDBs, we do not believe there is evidence that GPB's, and GTBs in particular, face the emerging technology risk that has been attributed to EDBs.[98]

104. Given the evidence currently available to us, we have decided not to make any changes to the IMs for GDBs at this stage in response to the issues outlined above. However, as mentioned earlier in the paper, should it become clearer in the future that emerging technology developments risk impacting gas networks, we have the ability to revisit the IMs in response.

[98] Methanex "Input methodologies review and gas DPP consultation cross-submission by Methanex New Zealand Limited" (18 August 2016), p. 2.

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

Purpose of this chapter

105. This chapter explains the problems relating to the treatment of revenues and costs between regulated and unregulated services in respect of emerging technology, our chosen 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.

106. 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

107. This chapter begins with the problems we have identified in this area, and then for each problem we set out the problem definition, our chosen solution and our assessment of other potential solutions.

108. 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

109. 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)).[99] It is important to note that the focus is on the services being delivered, not the choice of assets or technologies.

110. The pre-review cost allocation IM provided for three complementary approaches for EDBs and GPBs to allocate costs that are shared between regulated and unregulated services:

    110.1 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;

[99] 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.

110.2 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

110.3 the avoidable cost allocation methodology (**ACAM**), which allocates non-avoidable shared costs to the regulated service. ACAM was available where regulated and unregulated services have only a small proportion of their costs in common.[100]

111. We identified the following problems which related to the pre-review cost allocation IM:

111.1 problem 1, which related to the use of ACAM; and

111.2 problem 2, which related to the use of proxy cost allocators.

Problem definition for problem 1: Use of ACAM

112. Use of ACAM on a permanent basis for all or some of the costs of some regulated suppliers may allow a significant amount of shared costs (in absolute dollar terms) to be permanently allocated to the regulated service. As a result, potentially significant efficiency gains from the supply of regulated and unregulated services together will not be shared with consumers of regulated services now, or in the future.

113. When we first set the cost allocation IM in 2010, we recognised that the application of ACAM will, in most instances, not promote cost allocation and efficiency sharing outcomes consistent with those that occur in workably competitive markets. Rather, ABAA would be expected to move the allocation of shared costs closer to those in workably competitive markets than when applying ACAM. Nevertheless, we noted it was possible that, where shared costs are low, an approach that allocates shared costs between regulated and unregulated services (such as ABAA) will not produce outcomes that are materially different from those that would arise under ACAM.[101]

[100] 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. We have retained this constraint, so ACAM has not been removed from the cost allocation IMs entirely.

[101] Commerce Commission "Input Methodologies (EDBs & GPBs) Reasons Paper" (22 December 2010), para 3.2.65, 3.3.3, 3.3.5, 3.3.42 and 3.3.43.

114. Consequently, we decided that regulated suppliers should only be permitted to use ACAM as a stand-alone cost allocation methodology 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. For the purposes of cost allocation, this 1% threshold was interpreted as meaning approximately a 1%-2% impact. This guided our setting of percentage materiality thresholds for unregulated revenue, operating costs and asset values. Having such a threshold was intended to avoid changing a supplier's existing use of ACAM as its cost allocation methodology, where doing so would be unlikely to move outcomes materially closer to those produced in workably competitive markets.[102]

115. In our draft decision we proposed to lower the revenue materiality threshold to ensure that when EDBs or GPBs use ACAM that it would not result in increases to regulated revenue greater than 1-2%, compared to the use of ABAA.[103] In addition, we reiterated our original view that, subject to the materiality thresholds, ACAM would deliver outcomes that would not be materially different relative to the generalised use of ABAA.[104]

116. In our updated draft decision we agreed with Contact's submission to remove ACAM as a stand-alone cost allocation option.[105] Contact noted that the materiality thresholds set in terms of percentage of revenue, operating costs or asset values could still allow EDBs to invest hundreds of millions of dollars in emerging technology assets operated in contestable markets while utilising ACAM.[106]

117. Our updated view was that ACAM materiality thresholds based on a percentage of revenue or costs are not necessarily appropriate, especially for suppliers with relatively large cost bases (regulated asset base or operating expenditure).

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102 Commerce Commission "Input Methodologies (EDBs & GPBs) Reasons Paper" (22 December 2010), para B3.6.

103 Commerce Commission "Input methodologies review draft decisions: Topic paper 3 – The future impact of emerging technologies in the energy sector" (16 June 2016), para 112-113.

104 Commerce Commission "Input methodologies review draft decisions: Topic paper 3 – The future impact of emerging technologies in the energy sector" (16 June 2016), para 116.

105 Commerce Commission "Input methodologies review: Updated draft decision on cost allocation for electricity distribution and gas pipeline businesses" (22 September 2016).

106 Contact Energy submission on IM review draft decisions papers "Input methodology review" (4 August 2016), p. 14-15.

118. We noted that allowing ACAM to continue to be applied on a permanent basis for all or some of the costs of some regulated suppliers may allow a significant amount of shared costs (in absolute dollar terms) to be permanently allocated to the regulated service. As a result, potentially significant efficiency gains from the supply of regulated and unregulated services together will not be shared with consumers of regulated services now, or in the future. The magnitude of these foregone benefits appears likely to significantly outweigh any costs of removing ACAM, particularly in the case of larger regulated suppliers.[107]

Solution for problem 1: Remove ACAM as a stand-alone cost allocation option

119. Our solution in respect of this problem is to remove ACAM as a stand-alone cost allocation option from the cost allocation IM for EDBs and GPBs. Therefore, we are also removing all materiality tests associated with whether ACAM may be applied. EDBs and GPBs will continue to be allowed to allocate up to the ACAM level across all regulated services under OVABAA where relevant.

120. These changes will take effect for information disclosure purposes from (and including) the 2018/19 disclosure year.[108] These changes will therefore affect DPPs set for EDBs from the 2020 reset, and for GPBs from the 2022 reset. Changes will affect CPPs that take effect in or after 2020 for either EDBs or GPBs.

121. However, we encourage suppliers to implement these changes for information disclosure purposes before the above date. Earlier implementation will help to establish the need for any potential review of OVABAA.

Reasons for preferring this solution

122. Consistent with the framework for the review, we consider that removing ACAM while maintaining ABAA and OVABAA will continue to maintain incentives on suppliers to promote efficiencies through diversification in other regulated and unregulated services (consistent with ss 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)).

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107 These costs largely relate to changing regulatory accounting systems, and are therefore likely to be one-off or short-term in nature.

108 We note Wellington Electricity's submission that this timeframe should be extended by 12 months. See: Wellington Electricity "Input methodologies review: Response to technical consultation update paper" (3 November 2016), p. 7. We have responded to this submission in our Report on the IM review. See: Commerce Commission "Input methodologies review final decision: Report on the IM review" (20 December 2016), Attachment C.

123. Removing ACAM should allow for potentially significant efficiency gains from the supply of regulated and unregulated services together to be shared with consumers of regulated services in the future, especially over time.

124. The magnitude of these foregone benefits appears likely to significantly outweigh any costs from removing ACAM.[109]

125. A number of stakeholders, especially EDBs and their representatives, noted that our updated draft decision was not based on new information or compelling new evidence.[110] On the other hand, ERANZ submitted that:

> The Commission must be entitled to amend its view between the draft decision and the final determination based on submissions received in the process… Providing an updated draft decision for consultation is an additional step for which the Commission is to be commended rather than criticised… The Commission has sufficient evidence to revisit the assessment in its draft decision… While the concept of regulatory certainty is important, it should not be used to limit or restrict the Commission in making reasonable decisions within a reasonable process.[111]

126. We agree with ERANZ's view. We also note that the option to remove ACAM as a stand-alone cost allocation option is not new; it was raised in submissions[112] on our November 2015 pre-workshop paper and we considered it in our June 2016 draft decision.

127. Some stakeholders also submitted using ACAM subject to materiality thresholds has no material impact on prices for consumers of the regulated service, and therefore these consumers are not disadvantaged.[113]

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109 Unison submitted that it estimated the costs of developing new accounting systems to potentially be $50k to $150k. See: Unison "Unison submission on amended draft decision to remove ACAM as a cost allocation option from the input methodologies" (13 October 2016), p. 2.

110 For example, see: ENA "Input methodologies review updated draft decision on cost allocation – submission to the Commerce Commission" (13 October 2016), para 5-7; and Powerco "Submission on Input methodologies review: Updated draft decision on cost allocation for electricity distribution and gas pipeline businesses" (13 October 2016), para 7-12.

111 ERANZ "Cross submission on the updated draft decision on cost allocation for electricity distribution and gas pipeline businesses" (25 October 2016), p. 1.

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

113 For example, see ENA "Input methodologies review updated draft decision on cost allocation – submission to the Commerce Commission" (13 October 2016), para 11-13; and PwC "Submission to the Commerce Commission on Input methodologies review: Updated draft decision on cost allocation for electricity distribution and gas pipeline businesses" (13 October 2016), p. 6.

128. As explained above, we have refined our view of what is material in this context. We consider that costs potentially in the order of hundreds of millions of dollars, allocated to the regulated service under ACAM, are material. Even if this has no more than a 1-2% impact on the revenue of regulated suppliers in any particular year, it is the extended or potentially permanent application of ACAM that adds to the materiality, particularly from the perspective of foregone consumer benefits, in aggregate.

129. Furthermore, consistent with ERANZ's cross submission, we consider that the view of some suppliers that consumers of the regulated service are 'no worse off' under ACAM is not the appropriate interpretation of s 52A(1)(c) – the benefits of efficiency gains should be shared with consumers of the regulated service, which does not happen under ACAM.[114]

130. PwC submitted that their "second preferred option is to allow smaller EDBs (perhaps those with less than 100,000 ICPs) to continue to use ACAM… [to] reduce the harm caused by removing ACAM".[115] We considered this at the updated draft decision stage, and following PwC's submission. We have decided not to exempt smaller EDBs from the removal of ACAM. If necessary, we consider that compensating specific businesses for any incremental costs would provide greater ongoing net benefits to consumers.

131. Unison submitted that our decision to remove ACAM as a stand-alone cost allocation option had "taken into account irrelevant considerations about the impact on competition in other markets".[116] That is incorrect. As we made clear in our updated draft decision, our decision does not depend on any of the possible wider benefits that might arise if removing ACAM were to mitigate some concerns about impacts on competition in other markets. We consider that the long-term benefits from ensuring consumers of the regulated service are not permanently precluded from sharing in the efficiency gains from supplying regulated and unregulated services together are sufficient to outweigh any short-term costs from changing allocation approaches.

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114 ERANZ "Cross submission on the updated draft decision on cost allocation for electricity distribution and gas pipeline businesses" (25 October 2016), p. 5-6.

115 PwC "Submission to the Commerce Commission on input methodologies review: Updated draft decision on cost allocation for electricity distribution and gas pipeline businesses" (13 October 2016), para 12-13.

116 Unison "Unison submission on amended draft decision to remove ACAM as a cost allocation option from the input methodologies" (13 October 2016), p. 1.

132. Regarding OVABAA, some stakeholders submitted that its application would result in outcomes not necessarily consistent with outcomes in workably competitive markets.[117] A number of others called for a review of OVABAA "to identify if improvements can be made to make the option more practicable and less costly".[118] On the other hand, ERANZ considered that "a review of OVABAA is not necessary, at least until there is experience of it being used".[119] Yet others, such as MEUG, called for the removal of OVABAA arguing that "it would be bizarre if retention of OVABAA to ensure EDB could cross-subsidy [*sic*] forays into non-regulated businesses led to exit of or a reluctance of non-regulated suppliers to compete to offer that service".[120]

133. In respect of the removal of OVABAA, we agree with the ENA that it should be retained. Its removal would risk unduly deterring investment by suppliers of regulated goods or services in the provision of other goods or services, and therefore be potentially inconsistent with s 52T(3).

134. Regarding the need to review OVABAA, we agree with ERANZ that launching a review would be premature without first establishing the case for it, with clearly defined problems.

135. We are open to such a review in future if it becomes apparent that the current OVABAA specification is problematic. We note that a good way to test this is by suppliers actually using it. In that sense, the earlier that suppliers use it under information disclosure, without there being any revenue implications, the earlier any potential problems with OVABAA will become apparent.

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117 Unison "Unison submission on amended draft decision to remove ACAM as a cost allocation option from the input methodologies" (13 October 2016), p. 2.

118 For example, see: ENA "Input methodologies review updated draft decision on cost allocation – submission to the Commerce Commission" (13 October 2016), para 34-35; and PwC "Submission to the Commerce Commission on Input methodologies review: Updated draft decision on cost allocation for electricity distribution and gas pipeline businesses" (13 October 2016), para 15-16.

119 ERANZ "Cross submission on the updated draft decision on cost allocation for electricity distribution and gas pipeline businesses" (25 October 2016), p. 9.

120 MEUG "Submission on Update draft decision on Cost Allocation" (13 October 2016), p. 1.

136. Some EDBs also raised concerns regarding the implications of the removal of ACAM on their existing commercial agreements, mainly with telecommunications providers. Here are the main points raised and our response:

> …the use of network poles by telecommunications providers also provides an efficiency to customers on the price of the telecommunications service they receive… The efficiency benefits to consumers from avoiding dual telecommunications and electricity infrastructure, where possible, should not be underestimated.[121]
>
> Powerco has an arrangement with communications companies where fibre can be placed on some of our poles to assist with the Ultra-Fast Broadband deployment… Had we known… ACAM would not be an available option, we may have been less likely to reach the current agreement we have with the fibre provider.[122]
>
> In this respect [EDB asset sharing with telecommunications network service providers], ACAM has been successful with encouraging infrastructure collaboration to fulfil the government's communications infrastructure agenda.[123]

137. We agree that asset sharing between EDBs and telecommunication providers creates efficiencies. However, under ACAM, the beneficiaries of these efficiencies are not the EDB's consumers. As explained above, the intent of s 52A(1)(c) is that the benefits of efficiency gains are shared with consumers of the regulated service.

138. Furthermore, since both sides (EDBs and telco providers) benefit from asset sharing, we would not expect that a cost allocation methodology creates an outcome where infrastructure is duplicated (we would expect both sides to reach an asset sharing agreement, as they have). Finally, given that these are commercial arrangements, we would expect that EDBs will have sought the best deal they could achieve. It is not clear to us how changes in a cost allocation methodology would change this.

139. A number of EDBs mentioned that, since ACAM is still the implicit limit for both ABAA and OVABAA, they would still need to implement ACAM to ensure correct application of the cost allocation IM. They argued this could involve "considerable effort and cost".[124] Applying ACAM is not required, and therefore neither is the associated "cost and effort". We understand that in most cases, ABAA or OVABAA should result in less shared costs allocated to the regulated service. However, suppliers can elect to apply ACAM in order to satisfy themselves (or their auditors) that they are within the ACAM cost allocation limit.

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121 Wellington Electricity "Input methodologies review: Response to updated draft decision on cost allocation" (13 October 2016), p. 1-2.

122 Powerco "Submission on Input methodologies review: Updated draft decision on cost allocation for electricity distribution and gas pipeline businesses" (13 October 2016), para 13.

123 Vector "Vector submission on the draft decision on cost allocation for electricity distribution and gas pipelines" (13 October 2016), para 10.

124 For example, see: PwC "Submission to the Commerce Commission on Input methodologies review: Updated draft decision on cost allocation for electricity distribution and gas pipeline businesses" (13 October 2016), p. 8.

Problem definition for problem 2: Use of proxy cost allocators

140. There are two parts to this problem: first, the policy intent expressed in the 2010 reasons paper to justify the use of proxy cost allocators was not clearly carried over into the information disclosure requirements.[125] Second, some suppliers have not been as rigorous as they could be in justifying the use of proxy cost allocators when applying ABAA.

141. 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.[126]

142. 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.[127]

143. 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.

144. 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.

145. 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.

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

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

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

146. 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.[128] 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.

147. 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.

148. 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.

149. 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.

150. 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%).

151. While none of this necessarily indicates that EDBs have been applying the IMs incorrectly, we are concerned that proxy allocators are being used too 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.

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

Solution for problem 2: Use of proxy cost allocators

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

152. Our 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.[129] This will put greater onus on EDBs and GPBs to better demonstrate that:

152.1 a causal relationship cannot be established; and

152.2 the proxy cost allocator selected is appropriate.

153. In order to implement this, we have increased the quality of information we require under information disclosure, including requiring additional information about why suppliers could not use a causal allocator and why their selected proxy allocator is appropriate.

154. We consider that this solution better gives 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.

155. We note the submission from First Gas that the requirement to justify the use of a proxy cost allocator should be subject to a materiality threshold.[130] We disagree, and consider our solution will not impose a material burden on suppliers.[131]

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129 ENA and Powerco submitted that these requirements are better suited to the information disclosure determinations and should be included there only, rather than in the IMs. We disagree with these submissions and consider including these requirements in the IMs emphasises their importance. See: ENA "Input methodologies review: Technical consultation update paper – Submission to the Commerce Commission" (3 November 2016), p. 7; and Powerco "Submission on input methodologies review: Technical consultation update paper" (3 November 2016), p. 12.

130 First Gas "Submission on Input methodologies review draft decisions (excluding cost of capital)" (4 August 2016), p. 2.

131 Methanex submitted against imposing a materiality threshold. See: Methanex "Input methodologies review and gas DPP consultation cross submission" (18 August 2016), p. 1-2.

We considered requiring EDBs and GPBs to provide a declaration from their Chief Financial Officer

156. In our draft decision we proposed to require EDBs and GPBs to provide a declaration from their Chief Financial Officer (**CFO**) that no causal allocator was available and that their selected proxy allocator was appropriate. We have considered submissions and have decided not to require this CFO declaration.[132] This is because there is already a requirement for Director signoff for information disclosures, and the additional information on the appropriateness of proxy allocators will also be captured by the existing signoff requirement.[133] This information will help us assess whether the requirements need to be further tightened in future.[134]

Other submissions relating to information disclosure

157. We received a number of other submissions relating to information disclosure. For example:

    157.1 ERANZ submitted that schedules 5f & 5g of the ID requirements should be publically disclosed;[135]

    157.2 Methanex considered more onus should be placed on GTBs to produce a comprehensive cost allocation methodology which minimises the need for proxy allocators;[136] and

    157.3 the ENA suggested we should develop ID requirements to provide more information on the use of proxy allocators.[137]

158. Although we are not explicitly considering further changes to the information disclosure requirements at this time, we remain open to considering these issues in the future.

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132 For example, see: GasNet "Submission on input methodologies review draft decisions papers" (4 August 2016), para 15; Powerco "Submission on input methodologies review – Draft decisions" (4 August 2016), para 273; and Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), para 164-165.

133 *Electricity Distribution Information Disclosure Determination 2012* [2012] NZCC 22, Clause 2.9 and Schedules 17-18.

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

135 ERANZ "Submission to the Commerce Commission on input methodologies for emerging technology" (4 August 2016), para 140.

136 Methanex "Input methodologies review and Gas DPP consultation" (4 August 2016), p. 4.

137 ENA "Input methodologies review – Impact of emerging technologies – Submission to the Commerce Commission" (4 August 2016), para 33.

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

159. 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.

160. The issues in this area have evolved during the consultation process, and have been refined following the December 2015 workshop we held on the topic and following our draft decision in June 2016. We present the evolution of stakeholder views below.

Stakeholder views before the December 2015 emerging technologies workshop

161. 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.

162. 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.[138]

[138] Vector "Input methodologies review – Invitation to contribute to problem definition" (21 August 2015), para 10.

163. 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.

163.1 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.[139]

163.2 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.[140]

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139 Contact Energy "Cross submissions on the Commission's invitation to contribute to problem definition" (4 September 2015), section 1.

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

163.3 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.[141]

164. 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 changes presented earlier in this chapter.

Stakeholder views following the December 2015 emerging technologies workshop

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

165.1 the legal definition and interpretation of the regulated service;

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

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

166. Below we present a non-exhaustive selection of representative views for each theme. We respond to these views in paragraphs 188 to 251, except for the points raised on revenue allocation rules, which we address in paragraphs 173 to 174.

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[141] PwC "Submission to the Commerce Commission on Input methodologies review: Invitation to contribute to problem definition" (21 August 2015), p. 20 and 28.

The legal definition and interpretation of the regulated service

167. 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.[142]

168. This was enforced by the opinion of Russell McVeagh, for the ENA, who argued that batteries can be included in the RAB, regardless of whether they fall within the definition of lines when they are used to provide the regulated service.[143]

169. 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.[144]

> 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.[145]

170. This view was supported by a legal opinion from Alan Lear, for ERANZ, who argued that our statutory interpretation was not correct. He considered the correct interpretation was to exclude customer storage and EV batteries as they are in the competitive part of the electricity market.[146]

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

143 Russell McVeagh (report prepared for ENA) "Review of Alan Lear advice on definition of electricity lines services" (18 August 2016), para 4.

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

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

146 Alan Lear (report prepared for ERANZ) "Input methodologies review: Treatment of emerging technologies in the electricity industry under Part 4 of the Commerce Act 1986: legal definition and interpretation of electricity lines services" (4 August 2016), para 5.

Potential need for revenue allocation rules

171. 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.[147]

172. 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.[148]
>
> …
>
> 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.[149]

173. 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.

147 Electricity Retailers' Association of New Zealand (ERANZ), "Submission of Emerging Technologies – Workshop and Pre-workshop paper" (4 February 2016), p. 22.

148 ENA "Submission on IM review: emerging technologies" (4 February 2016), para 76.

149 ENA "Submission on IM review: emerging technologies" (4 February 2016), para 58-59.

174. 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.[150] 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'.[151]

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

175. The Electricity Authority sent a letter to us on this topic, where it outlined its thoughts and queries.[152] 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. Specifically, they raised a concern that competition could be reduced in ways that do not deliver long-term benefits to consumers. We published the letter as part of our draft decisions and welcomed stakeholder comment on it.

150 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 IM review: Commerce Commission "Input methodologies review final decision: Report on the IM review" (20 December 2016).

151 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).

152 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).

176. 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).[153, 154]

177. 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 submitted 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.

178. Three observations on ERANZ's proposal that are relevant for our response in paragraphs 190 to 213 below are:

178.1 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 of 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;

178.2 however, the aim of the 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

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153 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 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'.

154 ERANZ reiterated its proposal in its submission on our June 2016 draft decisions, and referred back to the detail in its 4 February 2016 submission on our emerging technologies workshop and pre-workshop paper (see footnote 153). See: ERANZ "Submission to the Commerce Commission on input methodologies for emerging technology" (4 August 2016), para 111-114.

178.3 the proposal would be implemented through the asset valuation IM, not the cost allocation IM.

179. Contact was concerned 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.[155]

180. 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.[156]

181. On the other side of the argument, the ENA did not consider that the Commission is best placed to impose structural restrictions:[157]

> 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).[158]

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

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

157 Other submitters also considered that structural change is a question for policy makers, not the Commission. For example, see: Orion "Submission on input methodologies review – draft decisions" (4 August 2016), para 22; PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers" (4 August 2016), para 211; Unison "Submission on the input methodology review" (4 August 2016); para 16; and Vector "Submission to Commerce Commission on the IM review draft decision and IM report" (4 August 2016), p. 4.

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

182. 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.[159]

183. The ENA also 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.[160]

184. Orion submitted emerging technologies will lead to material benefits in the electricity sector, including improved resilience, reliability and efficiency. Orion considered that these benefits would be best achieved by EDBs co-ordinating the technologies across the network, and that any regulatory intervention would increase costs to consumers.[161]

185. PwC submitted that the markets for emerging technologies are still nascent and it is not clear what kind of business model or product offering will be most successful:

> Retailers' closer relationship with the consumer may prove decisive. Alternatively, large global technology companies may be able to leverage their brand and scale to an extent that New Zealand firms cannot compete with. In the face of these other advantages, any cost sharing between regulated and unregulated business activities may not be very material.[162]

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

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

161 Orion "Submission on input methodologies review – draft decisions" (4 August 2016), para 15-17.

162 PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers" (4 August 2016), para 214.

186. Commenting on economies of scope, Trustpower submitted that:

> Third-party providers of network-supporting technology, especially owners of assets that have already been invested in, must be able to achieve the same economies of scope as a network company considering investing in the technology itself.
>
> We are not convinced that the incentives in the current Part 4 regime are sufficient to encourage network companies to contract with, and adequately compensate, third-party providers of network support services.[163]

187. This submission provides an alternative perspective on the economies of scope argument, which was generally considered in relation to EDBs' ability to benefit from these economies. It is relevant to the industry structure debate because, arguably, industry structures influences what types of scope economies arise, and who benefits from them – EDBs or firms operating in competitive markets.

Our perspective on the main issues raised by stakeholders

188. 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.

189. Our emerging technology pre-workshop paper contains relevant background that complements the views we present below.[164] For example, our view regarding the definition and interpretation of the regulated service remains unchanged (we expand on this below and respond to submissions on this matter). 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.

ERANZ's proposal

190. ERANZ provided a detailed proposal which ultimately aims to deliver a competitively-determined market price for the services delivered by emerging technologies. It relies on restrictions on EDBs' ability to include some assets in their RAB.[165]

191. We welcome ERANZ's proposal and consider that it raises a valid issue – the potential trade-offs between integration and competition; between economies of scope/transaction costs and concerns around leveraging of monopoly power in competitive markets.

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163 Trustpower "Trustpower submission on the input methodologies review draft decisions" (4 August 2016), para 1.2.1 c)-1.2.1 d).

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

165 ERANZ "Submission on emerging technologies – Workshop and pre-workshop paper" (4 February 2016), p. 18-21; and ERANZ "Submission to the Commerce Commission on input methodologies for emerging technology" (4 August 2016), para 111-114.

192. Regardless of where the optimal balance may lie in this trade-off, we do not consider that Part 4 is the appropriate instrument to implement changes to industry structure. On that basis, we have decided not to further consider the ERANZ proposal. This is explained in the next sub-section.

193. Regarding the merits of the trade-off, on the basis of the information currently available to us, we have concluded that it is not yet clear where 'the line should be drawn' along the integration-competition spectrum.

194. 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 later in the chapter.

195. Aside from the interpretation of the legal definition of the regulated service, it is currently unclear to us that restrictions on EDB ownership and operation of certain emerging technologies would benefit consumers of the regulated service more than the updated cost allocation IM, although we note it is possible it (or some other form of business separation) could. The requirement of arms-length transactions risks undermining the incentive on EDBs to improve efficiency through economies of scope, consistent with s 52A(1)(b).[166] In addition, the likely higher transaction costs associated with arms-length transactions is one important (and growing) factor that could cause this.

196. 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 competitive market (eg, various types of efficiencies) for delivering the services (both regulated and unregulated) of some emerging technologies. The development of such a market would be supported by a regulatory requirement for market transactions. However, as we explain below, we do not consider the case has been made for regulators to mandate market transactions in place of integration at this time.

197. 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.[167] This suggests that EDBs should be able to benefit from their existing assets and activities when providing new services. 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).

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166 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.

167 Submissions made the point that emerging technology was not in the horizon when Part 4, especially s 52T(3), was drafted. We note that s 52T(3) is generic and technology agnostic.

198. We note ERANZ's point that its proposal relates to the 'asset valuation IM', and therefore, in ERANZ's view, it is not in conflict with s 52T(3).[168] We disagree. The proposal is to impede allocation of asset-related common costs to the regulated asset base.[169] In doing so, it restricts EDBs' ability to benefit from their assets when providing new services. We consider that this would unduly deter investment by EDBs in those assets in the first place.[170] Therefore, we consider the ERANZ proposal is inconsistent with s 52T(3).

199. Some recent work suggests that "economies of scope and coordination will become increasingly important" as a result of growing deployment of widespread emerging technologies.[171] 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.[172]

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168 ERANZ "Submission on emerging technologies – Workshop and pre-workshop paper" (4 February 2016), p. 21.

169 Refer to s 52T(1)(a)(iii).

170 Section 52T(3) requires that it is the regulated supplier which must not be unduly deterred from investing in the supply of other services, not the broader corporate entity (or related party).

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

172 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, p. 39, 41 and 63. Available at: http://www.synergies.com.au/applying-the-hilmer-principles-on-economic-regulation-to-changing-energy-markets/.

200. 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.[173, 174] These new roles have been variously characterised, but probably share the attribute of more active network management.

201. 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 and given the current legislative framework.

202. 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.[175]

203. 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.

    203.1 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.

    203.2 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.

    203.3 Benefit: potentially appropriate pricing of the network benefit received by EDBs (and therefore appropriate cost imposition on consumers of the regulated service).

204. In other words, the benefits are conditional on the creation of a workably competitive market that does not fully exist today.

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173 For example, Powerco aims to evolve to a "Distribution System Integrator". Powerco, "Delivering New Zealand's energy future: electricity asset management plan 2016" p. 138-140.

174 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.

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

205. One way of characterising the issue is to ask whether consumers' interests are best served by regulators mandating market transactions in place of integration. 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.[176] 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 has 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 there is enough information at this stage to demonstrate that the factors that need to be present for a market to be the most efficient way for EDBs to acquire these services are present.

206. 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. Our decision to remove ACAM as a stand-alone allocation option should help alleviate some of the retailers' concerns without precluding EDBs from active involvement in these technology areas, where they may be the most efficient suppliers.

207. 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 of these efficiency improvements, consumers of unregulated services also benefit.

208. 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.[177]

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176 For example, Coase showed in his 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.

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

209. Trustpower made the point that "Third-party providers of network-supporting technology… must be able to achieve the same economies of scope as a network company".[178] We note that, depending on their circumstances, third parties should also potentially benefit from economies of scope. If they do, they should be able to offer their network support services to EDBs at more competitive terms than if they did not achieve those economies. We consider that the cost allocation IM does not stand in the way of this possible outcome.

210. Also, there is a requirement for EDBs to explain in their asset management plans the extent to which non-network alternatives were considered.[179] Similarly, the capex IM requires Transpower to consult on planned major capex projects, which includes invitation and consideration of grid and non-grid potential solutions to the identified need.[180]

211. Furthermore, application of the ACAM (which is no longer available as a stand-alone cost allocation option, but the outcome of which can still be achieved under OVABAA), 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). 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.

212. 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.

213. 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.

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178 Trustpower "Trustpower submission on the input methodologies review draft decisions" (4 August 2016), para 1.2.1.

179 *Electricity Distribution Information Disclosure Determination 2012* [2012] NZCC 22, Clauses 11.9-11.10.

180 See for example Transpower's recent July 2016 consultation "Waikato and upper north island voltage management long-list consultation: including invitation for information on non-transmission solutions".

Industry structure is not a matter for Part 4

214. 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 for 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 the United Kingdom as support for the proposition that ring-fencing measures should be implemented.[181]

215. We view ERANZ's proposal 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. Indeed Part 4, through s 52T(3), requires that our cost allocation rules do not unduly deter investments by suppliers of regulated services in the provision of other services.

216. Matters of industry structure in New Zealand have in the past been decided by policy makers and implemented through legislation.[182] 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.[183]

> 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.[184]

217. 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 and as mentioned above, in our view this approach would not be consistent with s 52T(3).

218. Therefore, our view is that structural changes in this context, if deemed necessary, are not best delivered indirectly by the Commission through changes under Part 4.

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

182 We note that the Commission may have an influence on industry structure in general, including through decisions on mergers and advocacy in relation to policy development.

183 Electricity Industry Act 2010, Part 3.

184 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).

Definition of the regulated service

Background

219. The definition of 'electricity lines services' is set out in s 54C and provides that:

> … *unless the context otherwise requires, electricity lines services* –
>
> (a) means the conveyance of electricity by line in New Zealand…

220. Section 54C(2) sets out a number of exclusions which generally relate to generation, services that are subject to actual direct competition and services excluded on the basis of their small scale.

221. Then s 54E provides that "electricity lines services are regulated" under Part 4.[185] Simply put, the definitions in the Electricity Act generally exclude "electrical installations" unless the "fitting" is used in association with the conveyance of electricity.

222. This structure provides guidance to the overall approach taken in the legislation, being that every service that falls within the very general description of "conveyance of electricity by line in New Zealand" is within scope unless it is expressly excluded in s 54C(2).

223. Based on this, in our pre-workshop paper, we set out the relevant questions to consider when assessing the scope of the regulated service. These are:

223.1 Is what the supplier is doing part of a service where the service is the conveyance of electricity by line in New Zealand?

223.2 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)?

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[185] Section 54C(4) incorporates the definition of "lines' in the Electricity Act 1992. "Lines" is defined in the Electricity Act as "works that are used or intended to be used for the conveyance of electricity". The definition of "works" incorporates the broad concept of "fittings" and excludes any part of an "electrical installation".

An "electrical installation" is defined by reference to the location or use of particular assets that are beyond the point of supply or that are used for generation. The relevant exception to this exclusion is any fittings that are used, designed or intended for use in or in association with the conversion, transformation, or conveyance of electricity by distribution or transmission lines (which is set out at (b)(iii) of the definition).

224. While there are exceptions from the definition of 'line' in the Electricity Act 1992, we do not consider these exceptions operate to exclude certain types of assets from being included in the RAB, where those assets are used by a supplier in (or in relation to) its supply of the 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, which is conveying electricity to the point of supply.

225. This legislative structure means that assets beyond the point of supply may fall within the scope of the regulated service, to the extent they are used or intended to be used by an EDB for the conveyance of electricity, to the point of supply.[186] In any event, there is no requirement for every asset used to support a regulated service to fall within the definition of a 'line' before it may be included in the RAB. For example, office equipment might be wholly or partly used in providing or supporting the supply of the regulated service, despite not being used for the physical conveyance of electricity by line.

Summary of submissions

226. 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 are subject to competition.[187]

227. 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:[188]

> 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)

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186 An asset that is a fitting beyond the supply which is used or intended to be used by an EDB for the conveyance of electricity to the point of supply would fall outside the definition of 'electrical installation', given that fittings designed or intended for use in or in association with the conveyance of electricity by distribution or transmission lines are excluded from that definition.

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

188 Contact Energy "Submission on the Commerce Commission's emerging technology pre-workshop paper: 30 November 2015 (workshop paper)" (4 February 2016), Appendix A.

228. Similarly, ERANZ submitted that our approach is a redefinition of the regulated service which effectively expands the scope of regulated activities,[189] and that, contrary to the intent of Part 4:[190]

> [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.

229. 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:[191]

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

230. Thus, in ERANZ's view, batteries are 'electrical installations' which are excluded from the definition of 'line' under the Electricity Act and therefore:[192]

> …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.

231. This view was further supported in the opinion of Alan Lear, for ERANZ.[193, 194] The opinion argued that assets used for services related to the storage and generation of electricity that are located beyond the point of supply are expressly not included in the definition of lines and that:

> The problem with the Commission's approach is that by not restricting the scope of the lines assets as defined, begs the very question as to what is the regulated service that assets have to be "used for" if no boundary is set as to where those assets may be located or of their nature.[195]

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

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

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

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

193 Alan Lear (report prepared for ERANZ) "Input methodologies review: Treatment of emerging technologies in the electricity industry under Part 4 of the Commerce Act 1986: legal definition and interpretation of electricity lines services" (4 August 2016), para 19.

194 Alan Lear's opinion was also supported by other submitters. For example, see: Mercury "Input methodologies review draft decisions Topic paper 3: The future impact of emerging technologies in the energy sector" (4 August 2016), p. 1.

195 Alan Lear (report prepared for ERANZ) "Input methodologies review: Treatment of emerging technologies in the electricity industry under Part 4 of the Commerce Act 1986: legal definition and interpretation of electricity lines services" (4 August 2016), para 20.

232. He argued that this is consistent with Part 4 as customer storage batteries are in the competitive part of the electricity market which should be allowed to develop without any distorting effects from the regulated/monopoly part.[196]

233. The opinion also considers that storage batteries do not fall within the exception to the definition of "electrical installation" as a matter of statutory interpretation.[197]

234. Genesis submitted that irrespective of whether the asset is used to supply regulated services, if it is beyond the meter the asset is in a different market to the network itself and the Commission should not be regulating the asset as there is competition in these markets. Genesis stated that the Commission should remove this decision from this process and allow more time for discussion with stakeholders and collection of evidence on the impacts of its approach.[198]

235. Meridian argued that Parliament only ever contemplated electricity lines services to be provided by poles and wires, not by batteries. In Meridian's view, the Commission's position fails to recognise the point at which a regulated provider has ceased to provide the regulated service contemplated by Parliament and is now providing something else instead.[199]

236. By contrast, other parties agreed with our technology neutral approach.[200] The ENA submitted that excluding batteries from the scope of lines would have perverse effects.[201] For example, other non-lines related assets would also be excluded (like office chairs) because they did not fall within the definition of 'lines'.[202] PwC submitted that it agreed with the Commission's position and to narrow the interpretation to just 'lines' would be unworkable and would prevent innovation.[203]

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196 Alan Lear (report prepared for ERANZ) "Input methodologies review: Treatment of emerging technologies in the electricity industry under Part 4 of the Commerce Act 1986: legal definition and interpretation of electricity lines services" (4 August 2016), para 5.

197 Alan Lear (report prepared for ERANZ) "Input methodologies review: Treatment of emerging technologies in the electricity industry under Part 4 of the Commerce Act 1986: legal definition and interpretation of electricity lines services" (4 August 2016), para 22-24.

198 Genesis "Input methodologies review draft decisions – Topic paper 3: The future impact of emerging technologies in the energy sector" (4 August 2016), p. 3.

199 ERANZ also submitted that the Commission's interpretation was beyond the scope of what had been defined by Parliament.

200 For example, see: PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers" (4 August 2016), para 209; and Vector "Vector cross submission on IM review submissions" (18 August 2016), para 11.

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

202 Orion submitted that a narrower view would exclude core activities like business support services.

203 PwC "Submission to the Commerce Commission on input methodologies review: Draft decisions papers – Made on behalf of 17 Electricity Distribution Businesses" (4 August 2016), para 210.

237. Russell McVeagh, for the ENA, submitted that Alan Lear's opinion misunderstands the correct legal position. Russell McVeagh argued, in line with the Commission's position, that an asset does not have to fall within the statutory definition of lines in order for it to be included in the RAB as a cost of providing the regulated service, but rather, it is the *use* of the asset that is the relevant question that determines whether it is in the RAB.[204]

Our conclusion

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

239. First, the focus of the definition of the regulated service is on the service provided, not on the specific types of assets being used to provide the regulated service. This also means that the type of asset being used is not important, that is, we consider that the Act is technology neutral. In terms of Meridian's argument, the approach taken in the Act means that it does not matter whether a pole, wire or battery is used in delivering the regulated service, but rather that the regulated service itself is delivered and the costs for the delivery of the regulated service are accounted for.

240. In response to Genesis' submission,[205] as set out above, the approach taken in s 54C has a broad inclusory approach to the definition of "lines", with specific and limited exclusions provided for. Given this, it is our view that Parliament has in fact addressed the possibility of competition in the exclusions set out in s 54C(2)(c).

241. 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, consider the situation where an EDB owns and controls a battery 'behind the meter' on a consumer's premises for the purposes of load control on the distribution network, to avoid or defer capital expenditure in relation to the conveyance of electricity to the point of supply. In this situation, while the asset is physically located beyond the point of supply, it is clearly being used for, or in support of, the conveyance of electricity to the point of supply. This is in contrast to a situation where a battery is used and controlled by the consumer only, and is not being "used in association with" conveyance of electricity to the point of supply.

[204] Russell McVeagh (report prepared for ENA) "Review of Alan Lear advice on definition of electricity lines services" (18 August 2016), para 22.

[205] See paragraph 234 above.

242. In this regard, in reference to Alan Lear's opinion, he considers the key question to be whether or not storage batteries are precluded from falling within the relevant exception in the "electrical installation" definition. However, we consider the key question to be whether the storage battery is used for, or in support of, the regulated service (ie, the conveyance of electricity by line). If the answer is yes, in our view the storage battery may be included in the RAB. It is not the nature of the storage battery itself (ie, that it is a storage device) that determines whether it may be included in the RAB.

243. Where an asset is used to provide both regulated and unregulated services, 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. This means that even if the battery is also being used to provide services in a competitive market, as argued by Genesis, where the battery is being used for the provision of the regulated service, an appropriate portion of costs can be allocated to the RAB.

244. 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.

245. 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.

246. 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. That is why the IMs allow such equipment to form part of the RABs of EDBs (and other regulated entities).

247. Overall, it is the *use* of an asset in supplying the regulated service which, under the asset valuation IMs, determines whether or not the asset may be included in the RAB, and if so, the cost allocation IM determines in what proportion.

Incentives on suppliers to act in the best interest of consumers

248. 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.[206] 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.

249. By capping revenues, EDBs are incentivised to find more cost-effective ways of delivering the regulated service.

250. Contact raised a concern that EDBs may not have incentives to realise the full value of investments, to the detriment of consumers (see paragraph 179 above).[207] We do not see why an EDB would not seek to derive the full benefit from their investments, regardless of whether they are used in the provision of the regulated or the unregulated service. They have an incentive to do so, and consumers of both regulated and unregulated services benefit as a result, since the costs of the investment are allocated to both services under ABAA.

251. 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 180 above). 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.

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

207 We understand that an example of Contact's concern could be where an EDB invests in an asset (eg, a grid-scale battery) that can be used to deliver both regulated and unregulated services, but the EDB only uses it to deliver regulated services. In this case, consumers of the unregulated service would not benefit from the investment.