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Input methodologies review

Emerging technology pre-workshop paper

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Wellington, NEW ZEALAND

Emerging technology pre-workshop paper

CONTENTS

Introduction

Purpose of and context for this paper

1. The purpose of this paper is to set out our current understanding of how some emerging technologies would be treated under the existing regulatory rules and requirements under Part 4 of the Commerce Act. We do this to share with interested parties our current thinking on this topic as part of the ongoing input methodology (IM) review and, in particular, assist representatives of interested parties prepare for the IM review's emerging technology workshop we will hold on 14 December 2015.

2. The objective of the workshop is to help define the problem relating to a key aspect of the IM review's topic of emerging technologies. We envisage that we and stakeholders will share and test our thinking on the regulatory treatment of the costs and revenues associated with emerging technology (ie, 'non-traditional') investments in the electricity distribution sector. We will do this by first aiming to build a shared understanding of how the current input methodologies, as well as price-quality determinations, treat the money flows associated with plausible emerging technology investments.

3. Therefore, the focus is not the impact of emerging technologies on areas of the industry not subject to regulation under Part 4.

4. The discussion in this paper is for the purpose of exploring the issues further in the upcoming workshop. It is not and should not be taken as the Commission's final views on any of the matters discussed.

5. The ultimate aim following the workshop, and in working toward our draft decisions on this IM review topic, is to answer the question: Is there a current or future problem with the regulatory treatment of the revenues and costs associated with emerging technology investments in the electricity distribution sector? If so, what changes to the current IMs appear likely to:

    5.1 promote the Part 4 purpose in s 52A more effectively;

    5.2 promote the IM purpose in s 52R more effectively (without detrimentally affecting the promotion of the s 52A purpose); or

    5.3 significantly reduce compliance costs, other regulatory costs or complexity (without detrimentally affecting the promotion of the s 52A purpose)?

6. In considering whether any IM changes might promote the s 52A purpose and s 52R more effectively, there are also a number of other considerations in Part 4 that are likely to be particularly relevant to the appropriate regulatory treatment of emerging technology investments. These include:

    6.1 section 52T(3) requires that any cost allocation input methodology we determine must not unduly deter investment by a supplier of regulated services in the provision of other regulated or unregulated services; and

6.2 section 54Q requires that when applying Part 4 to electricity lines services we must promote incentives, and must avoid imposing disincentives, for suppliers of electricity lines services to invest in energy efficiency and demand side management and to reduce energy losses.

Next steps

7. The next steps after this paper are:

   7.1 emerging technology workshop on 14 December 2015;

   7.2 written submissions on this paper by 4 February 2016.[1]

8. However, we encourage stakeholders attending the workshop to express their views on the contents of this paper at the workshop.

9. We also encourage stakeholders to send us questions you may have in respect of this paper in advance of the 14 December workshop. While we may not have answers to all of them at the workshop, it can help us focus the discussion on those issues stakeholders find important.

10. The draft decision is due to be published in mid-June next year and this will provide another opportunity for comment before the final decision paper is published at the end of next year.

Background to this paper

11. Stakeholder submissions to our problem definition paper helped us focus the topic of emerging technology in the energy sector. After reviewing submissions, we have confirmed the following areas of focus for the remainder of the IM review:

   11.1 Risk of partial capital recovery: the claimed problem is that emerging technologies may increase the risk that electricity networks become stranded.

   11.2 Efficient investment incentives: the claimed problem is that there may be inadequate investment incentives where investments:

      11.2.1 deliver benefits that are split among different parties along the value chain or that arise beyond the regulatory period;

      11.2.2 face wider market or political risks to full cost recovery.

   11.3 Regulatory treatment of cashflows from emerging technologies: This is an area which still lacks a clear problem definition, as we explain next.

12. Our attention for the remainder of the review will be to assess the evidence to validate the claimed problems under paragraphs 11.1 and 11.2 above, and if validated, determine whether IM changes are the best solution.

[1] Refer to page 30 on how to provide your view in a submission.

13. The focus of this paper and workshop is the area outlined in paragraph 11.3. Submissions were mixed on this area. Some submissions highlighted the importance of flexibility in the cost allocation rules and standards for the assets that go into the regulatory asset base (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.[2]

14. 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. 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[3]

15. Similarly, Mighty River Power 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.[4]

16. 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.

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

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

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

> 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.[5]

17. The current rules may not have been sufficiently tested under these 'non-traditional' investments. Therefore, to progress this issue we first want to ensure that all relevant stakeholders have a shared understanding of the rules. Secondly, we want to test the rules with stakeholders by using specific scenarios of plausible investments in an emerging technology.

18. We consider that the best way to progress this is to hold the workshop. We hope this will help us all determine whether there is a problem in this area that can be best solved through changes to the current IMs.

19. This paper provides relevant information on the rules and applies it to the scenarios. This should assist representatives of interested parties prepare for the workshop.

What and how we regulate? A recap

20. The purpose of this section is to provide a basic understanding of what and how we regulate. To summarise:

    20.1 We regulate the prices[6] and quality of electricity lines services supplied by EDBs. What determines *which* prices and revenues we may regulate is the definition of electricity lines services in s 52C—the scope of which is discussed further in paragraphs 57 to 67 below.

    20.2 We regulate prices and revenues by setting IMs, and through s 52P determinations, that determine what capital-related and operating costs, as well as financial incentives, may be recovered through the maximum revenues allowed for electricity lines services.

    20.3 We determine the appropriate *level* of prices charged for, or revenues recovered from, electricity lines services, in light of the s 52A purpose, and

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5 PwC "Submission to the Commerce Commission on Input methodologies review: Invitation to contribute to problem definition" (21 August 2015), pp. 20, 28.

6 Price is defined broadly in s 52C as "any 1 or more of individual prices, aggregate prices, or revenues (whether in the form of specific numbers, or in the form of formulas by which specific numbers are derived)", and "includes any related terms of payment".

other relevant requirements such as those in s 54Q.[7] The way we determine maximum revenues for default or customised price-quality paths is summarised in paragraphs 32 to 56 below.

21. This understanding should help answer the question of how the regime deals with some emerging technologies, which often present ambiguities which complicate the analysis.

22. To that end, we provide a high-level and simplified explanation of the key concepts; we do not provide a full picture of the regulatory regime. You should refer to our relevant determinations and reasons papers to get that full picture.

23. The scope of this section is limited to price regulation in the electricity distribution sector. It therefore excludes electricity transmission, gas distribution and transmission and airports.

We regulate prices and quality of electricity lines services

24. We regulate the prices and quality of 'electricity lines services',[8] as defined in s 54C of the Commerce Act (see more detail on this in paragraphs 57 to 67), through s 52P determinations that specify how default/customised price-quality regulation applies to EDBs.

25. Section 52P determinations set out price-quality paths for each EDB, and s 53M requires that each price-quality path must specify maximum prices/revenues, minimum quality standards, and the length of the regulatory period over which those prices/revenues and quality standards apply. In addition, price-quality paths may include incentives for EDBs to maintain or improve their quality of supply. Those incentives may include financial rewards or penalties that increase or decrease the EDB's maximum prices/revenues.

26. In respect of prices, we may only regulate the prices charged or revenue received by electricity distribution businesses (EDBs) for providing electricity lines services, and those prices/revenues alone. This means that, for example, if an EDB is in the business of tree cutting (unrelated to electricity lines safety clearances), and the nature of these activities does not fall within the definition of electricity lines services, then we may not regulate the prices the EDB charges or revenue it earns for these tree cutting services.[9]

27. The majority of revenue EDBs receive from the supply of electricity lines services is recovered from consumers through 'line charges'.[10] We currently regulate line

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7 In addition, Part 4 sets out specific considerations as to how default and customised price-quality paths must and may be set in subpart 6 of Part 4.

8 Commerce Act 1986, s 54G.

9 Table C1 of the EDB IM Reasons Paper identified some of the unregulated services that EDBs were supplying at the time the original IMs were set.

10 In setting price paths we also forecast 'other regulated income'—ie, income from the provisions of regulated services that is recovered in a different manner from line charges (eg, lease or rental income from regulated assets).

charges by setting a weighted average price cap (WAPC). To calculate the WAPC, we first determine the 'maximum allowable revenue' EDBs can recover for the provision of electricity lines services from consumers of these services, over each year of the regulatory period (typically five years). We then transform this revenue path into a weighted average price path by taking into account the electricity volumes EDBs are forecast to charge on through their network over that period (referred to as 'constant price revenue growth'). In addition, the maximum revenues we allow EDBs to recover through line charges also provide for EDBs to recover a range of costs that can be passed through to prices (consistent with the IMs we have set under s 52T(1)(c)(i)).

28. EDBs are free to set line charges different from the average price for specific customer groups or geographic regions, so long as the average of all these prices (weighted by the volumes supplied under each price) does not exceed the WAPC. Therefore, in practice, the price paths we set under s 52P constrain regulated revenues rather than individual prices, or the prices to particular classes of consumer.

29. EDBs also receive revenue from supplying electricity line services in the form of capital contributions, which is the amount EDBs charge the consumer for building or enhancing an asset which can directly benefit the consumer who pays the contribution.[11] Where these capital contributions relate to an asset that is wholly or partially used for the provision of electricity lines services, then these contributions are netted off (wholly or partially) from the RAB. The next subsection explains how the RAB affects the maximum allowable revenue.

30. EDBs can also receive regulated revenues from the disposal of assets from the RAB. This can happen if the EDB no longer requires the asset for the provision of electricity lines services and sells it. Or it might happen if the EDB sells a part of its functioning network to another regulated EDB.

31. So, how do we determine an EDB's maximum revenues for the provision of electricity lines services?

We make IM rules and other decisions on costs that affect how we determine maximum revenues

32. The price-quality paths we set through s 52P determinations regulate maximum prices/revenues for electricity lines services. These determinations do not regulate costs or assets. However, in making determinations on maximum revenues we apply input methodologies relating to the treatment of capital and operating costs, and make other decisions about costs as part of applying with the statutory provisions governing the setting of default/customised price-quality paths.

[11] Capital contributions are currently fairly narrowly defined as "money or the monetary value or other consideration charged to or received from consumers or other parties for the purposes of asset construction or enhancement" (ie, EDB IM Determination clause 1.1.4(2)).

33. We set maximum revenues allowing EDBs to recover:

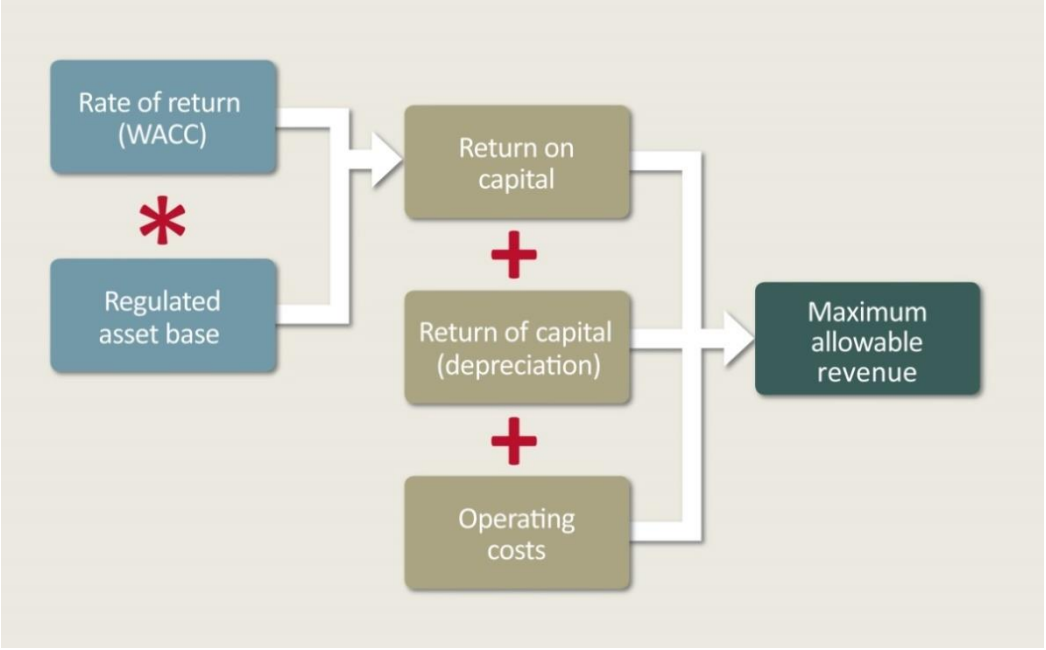
33.1 maximum allowable revenue, which as is discussed below, reflect 'building block' capital and operating costs incurred in the supply of electricity lines services;

33.2 pass-through cost and recoverable cost amounts (eg, levies, rates, transmission charges, and wash-ups for actual cost timing differences); and

33.3 provision for positive or negative financial incentives, which are given effect through recoverable costs (eg, quality incentive mechanism rewards and penalties, incremental rolling incentive scheme (IRIS) amounts, and energy efficiency and demand side management incentive allowances).

34. For both default and customised price-quality paths, we determine the maximum allowable revenue by adding up all the relevant cost components that an EDB is forecast to incur in providing electricity lines services over the regulatory period, plus a return on and return of its regulated assets. We do this using the 'building blocks' approach.

Figure 1: Simplified building blocks diagram



Note: This is a simplified illustration of the building blocks. It excludes a number of components that are not central to the purpose of this paper.

35. As pictured above, the basic[12] 'building blocks' are:

35.1 return *on* capital costs: results from multiplying the RAB by the weighted average cost of capital (WACC);

35.2 return *of* capital costs: equals the depreciation of the RAB in that year;

35.3 operating costs.

36. Based on this, the central questions in the context of emerging technologies in determining the maximum allowable revenues are:

36.1 which *types* of capital costs and operating costs *can* currently be recovered?

36.2 what *proportion* of the capital and operating costs *can* currently be recovered?

36.3 what *types* and *proportion* of the capital and operating costs *should* be recovered?

Which *types* of capital and operating costs *can* currently be recovered?

37. Regarding capital costs, the asset valuation IM[13] which is applied in setting a default price- quality path sets out some rules on what *types* of assets (and therefore capital costs) may be included in, or must be excluded from, the RAB. However, the IM does not provide an exhaustive or prescriptive list of types of assets that may be included in the RAB, because when we set the IMs we considered the following:

> If the Commission provided a definition of the boundary between electricity line services [and other services], as proposed by PwC (for example, with reference to specific asset types) it would run the risk of unintentionally excluding assets that legitimately should be included in the RAB value. Further, such a definition could become out-of-date as technology and business practices change. On balance, the Commission considers that further prescription on this topic is not warranted.[14]

38. Instead, we have relied on an EDB to determine whether an asset is used to provide electricity lines services. If it does, its capital cost may be included (not necessarily in its entirety) in the RAB value disclosed by an EDB. When we set the IMs, we considered that:

> The requirement that a new asset must be 'used' in the definition of 'commissioned' is a practical way of ensuring that only assets that are used to provide electricity distribution services or gas pipeline services are included in the RAB value. Whether an asset is 'used' is

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12 We have excluded a number of cost components that contribute to determining the maximum allowable revenue, but which are not central to the purpose of this paper. For example, the full building blocks model includes revaluations, a tax allowance, a return on the deferred tax balance, recoverable costs and pass-through costs and various other fees and charges incurred by the EDBs.

13 *Electricity Distribution Services Input Methodologies Determination 2012,* Part 4, subpart 2.

14 EDB IM Reasons Paper paras E2.31-E2.37.

a purely factual matter within the knowledge of EDBs and GPBs, which can be objectively assessed by regulated suppliers and interested parties.[15]

39. Regarding operating costs, the relevant consideration is whether the costs can be attributable in whole or in part to the provision of electricity lines services. Similar to capital costs, in disclosing its operating costs the onus is on an EDB to be able to demonstrate that a cost is in fact attributable to the service. If the costs are attributable in whole or in part, then they may be included (not necessarily in its entirety) in determining the maximum allowable revenue.

40. One of the few specific references to a particular type of fixed asset in the IMs is to load control relays. Where EDBs, as part of conveying electricity by line, implement load control through relays installed beyond the point of supply or "behind the meter" (eg, to control residential water heaters), they may:

    40.1 where the load control relay is owned by the electricity retailer, include any fee paid to the retailer as an operating cost that may be recovered through regulated revenue; or

    40.2 where the load control relay is owned by the EDB, include the relay in the RAB.[16]

41. The rationale for this approach was that allowing EDBs to include relays in the RAB when they own them, subject to the cost allocation IM described below, would ensure decisions whether to own or rent these assets are not distorted.[17]

42. The emergence of non-traditional technologies may mean it is less straight-forward to determine which EDB prices may be regulated, and which costs may or should legitimately be recovered by the EDB in regulated prices. Even if no changes to the IMs are found to be necessary, it may still be worth providing a greater level of guidance than is currently the case. Consequently, in paragraphs 68 to 121 of this paper, we set out some draft guidance and some example scenarios.

What *proportion* of the capital or operating costs *can* currently be recovered?

43. The cost allocation IM[18] specifies rules for determining the *proportion* of the capital costs (ie, asset values) and operating costs that may be allocated to the regulated service (ie, electricity lines service), and therefore may be included for the purposes of determining the maximum allowable revenue.

44. When considering an asset or activity, there are two relevant cases that influence the treatment of the associated costs:

    44.1 Case 1: Asset is solely used for (or activity supports) the provision of regulated services. In this case, the entirety of the capital costs and

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15 EDB IM Reasons Paper para E4.4

16 EDB IM Determination clause 2.2.1(2)(a)

17 EDB IM Reasons Paper para E2.35).

18 *Electricity Distribution Services Input Methodologies Determination 2012,* Part 4, subpart 1.

operating costs associated with the asset or activity are included in the building blocks calculation to determine maximum allowable revenue. Since the asset or activity does not provide unregulated services, the regulated revenue is the only revenue stream.

44.2 Case 2: Asset is used for (or activity supports) the provision of both regulated and unregulated services. We discuss this case below.

45. Some EDBs provide both regulated and unregulated services. As a result, they must allocate shared capital and operating costs between these services and they may earn different revenue streams from the provision of these services. The cost allocation IM is designed to deal with this scenario on the costs side. There is no equivalent revenue allocation IM.[19]

46. We provide a brief overview of the cost allocation IM in the next section, and a more detailed summary in Appendix 2.

How are costs treated?

47. The cost allocation IM requires that any operating costs and regulated service asset values (ie, capital costs) that are directly attributable to electricity distribution services supplied by the EDB must be allocated to those electricity distribution services. It also provides that any operating and/or capital costs that are not directly attributable must be allocated to electricity distribution services and other regulated services using either:

47.1 accounting-based allocation approach (ABAA);

47.2 avoidable cost allocation methodology (ACAM); or

47.3 optional variation to the accounting-based allocation approach (OVABAA).

48. In order to determine whether the EDB is able to apply ACAM to operating costs and regulated service asset values, it must apply materiality screening tests (see Appendix 2 for more details). If the thresholds in these tests are not reached, an EDB can apply ACAM, otherwise it should apply the ABAA. The EDB also has the option of applying the OVABAA[20] if it considers that any unregulated services will be unduly deterred. Irrespective of the outcomes of materiality screening tests or OVABAA, the EDB may always elect to apply the ABAA.

49. One important point is that the ABAA relies on causal factors (or proxy factors where causal-based allocators are not available) to allocate costs. These factors are likely to be related to how the use of an asset/activity is split between the delivery

[19] We have no rules for allocating EDB revenue, as we have implicitly assumed to date that prices for EDB-supplied services are 100% directly attributable or not attributable to electricity lines services—ie, this assumes EDBs do not set charges for bundled regulated and unregulated services. This assumption, and therefore the need for revenue allocation rules, may have to be revisited as/if EDBs start to set bundled charges for regulated and unregulated services.

[20] We note that to date, none of the EDBs have applied OVABAA.

of regulated and unregulated services. This split may change over time. However, the way the price quality path operates means that any changes in how a shared asset is used (and any consequential impact on how its costs are shared) from what was assumed when setting the price-quality path will not be reflected until the next price path reset.

What is the impact on revenues?

50. In this case, there may be additional revenues streams for the EDB beyond the regulated one. For determining the regulated maximum allowable revenue, we will only consider the proportion of capital and operating costs that result from the application of the cost allocation IM. The remaining costs therefore become allocated to the unregulated service(s).

What *types* and *proportion* of the capital and operating costs *should* be recovered?

51. Overall, our IM and other decisions that underpin the maximum revenue that is currently recovered through the maximum allowable revenue are governed by the relevant legislative provisions, particularly the purpose statement in s 52A, as well as other relevant requirements such as s 54Q and s 52T(3).[21] This includes decisions on the capital and operating costs that we consider *should* be able to be recovered (and in what proportion).

52. For example, when we evaluate CPP proposals, we consider the extent to which the proposed CPP will promote the s 52A purpose. In particular, we consider whether proposed capex and opex reflect the efficient costs that a prudent regulated supplier would require to meet or manage demand for the relevant services, at appropriate service standards, during the forthcoming CPP regulatory period.[22]

53. In respect of s 54Q, we have recently introduced a financial incentive mechanism in the default price-quality paths for EDBs that compensates them for revenue foregone as a result of demand side management initiatives.[23]

54. In respect of s 52T(3), as is discussed further in Appendix 2, under some circumstances the cost allocation IM allows EDBs to recover the full non-avoidable cost of assets used to supply both electricity lines services and unregulated services.

55. Summarising at this point, it should be clear that deciding if what the supplier is doing contributes to the provision of the regulated service of conveying electricity by line (ie, it helps provide an electricity lines service) is the important first-order consideration.

56. The next section addresses this and answers the question: what can be considered within scope of the regulated service?

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21 We note that s 52T(3) is directly relevant to IM decisions.

22 EDB IM Determination, clause 5.2.1.

23 Commerce Commission, Default price-quality paths for electricity distributors from 1 April 2015 to 31 March 2020, Main policy paper, 28 November 2014, paras 7.18-7.27.

What can be considered within scope of the regulated service?

57. The relevant questions when considering the scope of the service regulated under Part 4 are:

    57.1 is what the supplier doing part of a service, where the service:

        57.1.1 is the conveyance of electricity by line in New Zealand (ie, on the distribution or transmission network[24]); and

        57.1.2 is not excluded by any of the exceptions listed s 54C(2)?

58. These questions reflect the statutory provisions defining the regulated service for electricity under Part 4 of the Commerce Act.[25] Section 54E of Part 4 of the Commerce Act provides that 'electricity lines services' are regulated. Section 54C defines 'electricity lines services' as 'means conveyance of electricity by line'.

59. To interpret the meaning of 'by line', s 54C(4) incorporates the definition of 'lines' in the Electricity Act 1992, 'unless the context otherwise requires'. 'Lines' is defined in the Electricity Act as 'works' (incorporating the broad concept of 'fittings') and with an exclusion for 'any part of an electrical installation'. 'Electrical installation' has a complex definition, which (in summary) 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.

60. We consider that the phrase in s 54C, 'conveyance of electricity by line', combined with the exclusion of 'electrical installations' from the meaning of lines reflects the intention to define the regulated services in a way that is understood to include transmission and distribution network services. We consider that the Electricity Act definitions referred to through s 54C (of lines, works and electrical installations) provide a description of the network (ie, it ends at 'the point of supply' as described in electrical installation definition, because 'lines' and 'works' exclude 'electrical installations').

61. This view is supported by the context and purpose of Part 4, and in particular s 52 which confirms the intention of Part 4 to provide for the regulation of services in markets where there is little or no competition (such as distribution and transmission networks).

62. We consider that the definition of 'line' is relevant only to the extent that it describes the nature of the lines service (ie, what the network is) and not as an exclusion of particular types of assets from being considered as supporting the

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[24] As a general point these considerations would apply to the transmission network. However we have not separately considered the case of Transpower's transmission network and the inclusion of the services performed as system operator under s 54C(1)(b).

[25] Statutory provisions of the Commerce Act 1986, Electricity Act 1992 and Electricity Industry Act 2010 that are referred to in this section are included in Appendix 1.

regulated service.[26] Specifically, we do not think the effect of s 54C(4) is that assets that fall within the definition of 'electrical installation' are necessarily outside the scope of Part 4 regulation. So assets (or costs attributable to activities) beyond the point of supply may fall within the scope of the regulated service, to the extent they are used by an EDB in conveying electricity by line.

63. Section 54C(2) specifies a number of services that are excluded from the definition of "electricity lines services". These essentially cover generation, services that are subject to actual direct competition from other suppliers of electricity lines services, and services excluded on the basis of their small scale.

64. The scope of the service that is regulated as an electricity lines service is, therefore, the service of conveying electricity by line in a manner not excluded by s 54C(2).

65. Following from this, the next test in determining what falls within the scope of the regulated service is whether an asset is "used to provide" or "used to supply" the regulated service (here the service of conveying electricity by line).[27] This test similarly applies to the question of whether an activity forms part of the regulated service, in which case the question is whether the costs associated with that activity are attributable to the regulated service.

66. It is important to note that the test is whether the asset is used in providing (or the costs are attributable to) the service, not to whether they are themselves actually used (or incurred) in the physical conveyance of electricity.

67. It is acknowledged that factors outside of the Commerce Act and the definition of "electricity lines services" may, in practice, impact on the scope of the service that a supplier of electricity lines services is permitted to provide, and thus to the scope of the service that is in fact regulated.[28] This is a separate matter to considering whether the service meets the definition in s 54C.

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[26] For instance an office chair may support the regulated service of a distribution network because it allows an office worker to support the service. But the chair does not need to be collocated with the network itself.

[27] Examples of services the Commission has considered as forming part of the regulated service include; for Transpower, alternatives to investment in the grid including investment in local generation, energy efficiency, demand-side management and local network augmentation can be opex or capex (EDBs 2012 Capex IM Reasons Paper at [2.8.9]); for Orion CPP, the Commission allowed recovery of "power factor correction equipment" and instructed Orion it would expect that as part of managing the expected demand for electricity distribution services, as is required under the expenditure objective, a prudent EDB would take into account both network as well as non-network alternatives including local generation (Orion CPP Decision at [3.24]).

[28] For instance there are restrictions on distribution businesses engaging in large-scale generation in the Electricity Industry Act 2010. However we also note that the continuance of supply obligation (under section 105 of the Electricity Industry Act) may be relevant to interpreting the scope of the regulated electricity lines service under the Commerce Act, Part 4. This obligation requires distributors to continue supply of line function services to consumers (who had supply in 1993). The supply obligation can be provided for from the distributor's network or with electricity from an alternative source (ie, from a source other than the distributor's network). The Electricity Industry Act, section 108(4) requires the Commission to treat costs of providing electricity to a place from an alternative source as if they were the cost of providing electricity lines services (ie, the regulated service under the Commerce Act). This

What does this mean for emerging technology investments? A case study

68. The scenarios in this case study aim to demonstrate the application of our thinking on the regulatory treatment of the costs and revenues associated with a plausible emerging technology. They are not meant to be exhaustive. We make a number of assumptions that may (or may not) be realistic, but which simplify the analysis while keeping it relevant.

69. The case study examples we present in this section are about the regulatory treatment of investments in electricity storage by means of batteries. These batteries are ultimately connected to the EDB's network, either embedded on the distribution network itself, or on the consumer's premises (ie, behind the meter). We present three alternative investment scenarios to explore whether/how the regulatory treatment changes in each one.

70. For the purposes of these scenarios we have assumed that the EDB is not restricted from engaging in the activities described (eg, under the Electricity Industry Act 2010 (eg, for large scale generation or retail)).

71. The key question in each scenario is: how do the current rules treat the revenues, capital costs and operating costs associated with this investment?

72. To answer that question, each scenario follows the same sequential logic, which involves answering the following intermediate questions:

Box 1: Key questions

Within scope of the regulated service?

Is what the EDB doing part of the service of conveyance of electricity by line, and not excluded by any of the exceptions listed in s 54C(2)?

Treatment of capital costs

Is the asset used for the service of conveyance of electricity by line? If so, how are the capital costs associated with this investment treated?

Treatment of operating costs

Are the operating costs attributable to the service of conveyance of electricity by line? If so, how are the operating costs associated with this investment treated?

Treatment of revenues

Are the revenues attributable to the service of conveyance of electricity by line? If so, how are the revenues associated with this investment treated?

provision is relevant as such alternative sources might otherwise fall within an exception in s 54C(2) of the Commerce Act (exceptions to the regulated service).

Table 1: Overview of the scenarios

Scenarios relate to investment in batteries	**Scenario 1** Distribution network battery	**Scenario 2** Consumer owned and controlled battery behind meter	**Scenario 3** EDB owned and controlled battery behind meter
Explanation	EDB buys and installs battery in its network as an alternative to traditional network upgrades. Battery is metered	Consumer buys battery from EDB and installs it behind the meter in order to reduce its bill by optimising the time of sourcing electricity from the grid	EDB buys and installs battery behind the meter as an alternative to traditional network upgrades
Location	EDB network	Consumer premises	Consumer premises
Ownership	EDB	Consumer	EDB
Control	EDB	Consumer	EDB
Use (NB this also includes secondary uses and/or unintended effects caused by how the battery is used)		Reduce bill by optimising time of use (primary for consumer)	Reduce bill by optimising time of use (primary for EDB and consumer)
	Avoid/defer Capex (primary)	Avoid/defer Capex (unintended)	Avoid/defer Capex (secondary for EDB)
	Improve reliability	Improve reliability (primary for consumer)	Improve reliability (secondary for EDB)
	Reduce transmission charges	Reduce transmission charges (unintended for EDB)	Reduce transmission charges (secondary for EDB)
	Potential unregulated service*		Potential unregulated service*
Revenue streams (excluding line charges)	*Received by EDB*	*Received by EDB*	*Received by EDB*
	Revenue from selling energy when discharging the battery		Revenue from quality incentive scheme
	Revenue from quality incentive scheme	Revenue from sale of battery	Revenue from unregulated services*
	Revenue from unregulated services*		Lease payments from consumer
Capital costs	*Incurred by EDB*	*Incurred by consumer*	*Incurred by EDB*
	Battery (purchase and commissioning)	Battery (purchase and commissioning)	Battery (purchase and commissioning)
Operating costs	*Incurred by EDB*	*Incurred by consumer*	*Incurred by consumer*
	Wholesale energy purchases	Retail energy purchases	Retail energy purchases

Notes: *There could be several unregulated services which generate revenue streams, like selling ancillary services to the system operator. (1) Battery system means a battery and associated control equipment; (2) Battery system is generic and could be a Powerwall, electric vehicle or other system. The battery system is fixed and not a short term support arrangement; (3) All required and expected industry standard arrangements are in place, ie, the consumer has a retailer who has a network services agreement with the distributor etc. There will be appropriate arrangements to cover the injection of electricity into the network from the battery system.

Scenario 1 – EDB-owned battery in the distribution network

Overview

73. An EDB installs a grid scale battery system (battery) at one of its zone substations (substation). The battery is installed as part of the grid assets, so it is not located beyond the point of supply (ie, meter in consumer premise).

74. This scenario makes the following assumptions:

    74.1 The EDB places bids to the system operator to charge/discharge.

    74.2 The EDB buys/sells the energy it charges/discharges.

    74.3 As a result, the EDB meters the energy it charges/discharges, so the battery is metered.

75. The EDB owns and controls the battery. The EDB charges the battery when the amount of electricity flowing through its network is low, as is the price of wholesale electricity. It discharges the battery when electricity demand in its network is high.

76. In the evenings of cold winter months, as consumers heat their houses and the lights come on, electricity demand exceeds the capacity of the distribution network supplying the substation that houses the battery (ie, the sub-transmission network which is between the transmission grid exit point and the substation). The EDB is able to meet demand by discharging the battery into the distribution network past the substation (ie, the bit of the distribution network between the substation and the points of supply in consumer premises).

Uses of the battery

77. **Avoid/defer capital expenditure**: The EDB installs the battery in order to meet peak electricity demand. This is the primary reason for doing so. This scenario assumes that this is a cost effective alternative to upgrading the distribution network with 'traditional' solutions, so the EDB incurs lower capex than would otherwise be the case.

78. **Improve reliability**: In the event of a failure in the network that supplies the substation housing the battery, the EDB can use the electricity stored in the battery to supply some of its consumers. This might improve the EDB's quality performance (ie, SAIDI and SAIFI).

79. **Reduce transmission charges**: The EDB can inject electricity from the battery during periods of peak electricity demand, even when daily peak demands are less than the capacity of the distribution system (eg, in a summer day). Discharging the battery in this way reduces the amount of peak electricity drawn from the

transmission network. This reduces transmission charges, since some of the transmission charges are based on peak demand.[29]

80. **Potential unregulated services**: This scenario assumes that the EDB could use the battery for at least one unregulated service. This could be selling ancillary services to the system operator (eg, instantaneous reserves), among potentially others.[30] For the purpose of this scenario, it suffices to say that the EDB uses the battery for at least one unregulated service, and there are revenues associated with this unregulated service.

Within scope of the regulated service?

81. A battery can be used as an alternative to increasing the capacity of a network and, in turn, to defer the need for investment in more traditional network assets (**avoid/deferring capex**). By deferring capex the supplier is managing the way it provides the service of conveying electricity in a different way. The deferral of capex could be seen as a way of providing for the conveyance of electricity by line.

82. A battery which is being used to **improve reliability** is providing the service of conveying electricity by line as it is being used to ensure the network can continue operating to meet demand. It is part of providing the service of conveying electricity to have a network with sufficient capacity to meet demand.

83. Similarly, where a battery is used to **reduce transmission charges** this may reduce the cost of providing the service of conveyance of electricity by line. The supplier could be doing this as part of the service of conveying electricity by line.

84. What the supplier is doing with the battery (improving reliability, deferring capex, and reducing transmission charges) is not excluded under the exceptions in s 54C(2) of the Commerce Act. For instance the exceptions for generation, services where there is actual competition or on a small scale (given the suppliers network will be above the small scale threshold) do not apply.

85. As a result we consider that what the supplier is doing with the battery can be considered part of the regulated service.

86. In addition, the supplier uses the battery to provide other services that are not part of the service of conveyance of electricity by line.

Costs

87. The capital costs associated with this investment are those of purchasing and commissioning the battery. They are incurred by the EDB.

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[29] We note that the relevance of peak transmission pricing could change as a result of the ongoing Transmission Pricing Methodologies review work. We also note that while one EDB may reduce the transmission *charges* it faces, overall transmission *costs* in the short term are unchanged, and so other EDBs (and their consumers) would have to face higher transmission charges if Transpower is to recover its costs. EDBs and consumers could benefit from lower transmission costs in the longer term to the extent that peak demand is reduced.

[30] Subject to any applicable legal restrictions.

88. The operating costs associated with this investment are the wholesale energy purchases to charge the battery. They are incurred by the EDB.

Revenue streams

89. Excluding line charges resulting from the application of the building blocks, the EDB has three revenue streams associated with this investment:

    89.1 Revenue from selling the energy when discharging the battery.

    89.2 Potentially an uplift to its allowed revenue from the quality incentive scheme, driven by an improvement in the EDB's quality performance.

    89.3 Revenue from the unregulated services that the battery allows the EDB to deliver.

90. So what is the regulatory treatment of the costs and revenues in this scenario? We answer this in box 2 below.

Box 2: Regulatory treatment of costs and revenues in scenario 1

As explained above, some of the *uses* the EDB is making of the battery can be considered part of the regulated service.

Treatment of capital costs

Is the asset used for the service of conveyance of electricity by line? Yes, the battery is used to provide the service of conveying electricity by line. It is also used to provide unregulated services. Therefore, the EDB must apply the cost allocation IM to allocate the capital costs of the battery. If the materiality thresholds are not reached, the EDB can use ACAM and so allocate *all* the non-avoidable capital costs of the battery to the regulated service (ie, add them to the RAB). Otherwise, the EDB must use ABAA for the allocation (unless this would unduly deter the investment, in which case it may elect to use OVABAA), which would result in a greater proportion of the capital costs being allocated to the regulated service than under ABAA.

Treatment of operating costs

Are the operating costs attributable to the service of conveyance of electricity by line? Yes, the operating costs are attributable to the service of conveying electricity by line. However, they are also attributable to other unregulated services. Therefore, the EDB must apply the cost allocation IM to allocate the operating costs of the battery. If the materiality thresholds are not reached, the EDB can use ACAM and so allocate *all* the non-avoidable operating costs of the battery to the regulated service. Otherwise, the EDB must use ABAA for the allocation (unless this would unduly deter the investment, in which case it may elect to use OVABAA), which would result in a greater proportion of the capital costs being allocated to the regulated service than under ABAA.

Treatment of revenues

Are the revenues attributable to the service of conveyance of electricity by line? Yes, but only partially. The treatment of the capital and operating costs of the battery described above will impact the allowed revenue which the EDB recovers through line charges. In addition, the EDB may receive three revenue streams. Here is how they are treated:

- Revenue from selling the energy when discharging the battery: for discussion at workshop. The questions to answer to determine the regulatory treatment include: what kind of transactions would arise (ie, selling energy, to whom, for what purpose)? Would this be a case of a charge that bundles regulated and unregulated services? Does this give rise to the need for revenue allocation rules?

- Uplift to its allowed revenue from the quality incentive scheme: this is additional revenue for the EDB, driven by an improvement in the EDB's quality performance (this is attributable to the service of conveyance of electricity by line).

- Potential additional revenues from unregulated services: these revenues are not attributable to the service of conveyance of electricity by line (eg, potentially selling ancillary services to the system operator). Therefore, they are unregulated.

Scenario 2 – Consumer-owned and controlled battery

Overview

91. A consumer buys a domestic battery from an EDB (not necessarily the EDB serving the area where the consumer resides) and installs it on its side of the point of supply (ie, behind the meter).

92. The consumer owns and controls the battery. It charges it when retail electricity prices are low and discharges it when these prices are high. We make the following assumptions:

    92.1 The consumer is on a time-of-use tariff offered by its retailer.

    92.2 There is no contract between consumer and EDB. Therefore, within the regulatory period, the consumer cannot directly benefit from (or EDB cannot pass through savings from) potentially avoided/deferred capex, improved reliability nor reduced transmission charges.[31]

    92.3 In the event of a failure in the EDB's network, the battery would maintain the consumer's electricity supply to the extent it is charged.

Uses of the battery

93. **Reduce bill by optimising time of use**: The customers buys and uses the battery to reduce its electricity bill by optimising the timing of sourcing electricity from the grid. This is the primary reason for doing so.

94. **Avoid/defer capital expenditure**: The consumer does not explicitly use the battery for avoiding/deferring capex needs by the EDB. However, this could be an *unintended* effect to the extent that the time-of-use tariff driving the charging/discharging decisions is structured in such a way that the 'peak retail price' is aligned with peak demand in the EDB's network.

95. **Improve reliability**: The consumer also uses the battery to avoid supply interruptions in the event of a failure in the EDB's network. This is also a primary reason for installing the battery.

96. **Reduce transmission charges**: The consumer does not explicitly use the battery to reduce transmission charges faced by the EDB. However, this could be an *unintended* effect to the extent that the time-of-use tariff driving the charging/discharging decisions is structured in such a way that the 'peak retail price' is aligned with 'peak transmission price' faced by the EDB. This would have the effect of reducing the amount of peak electricity the EDB draws from the transmission network. This reduces transmission charges, since some of the transmission charges are based on peak demand.

[31] To the extent these savings materialise, they should have the effect of lowering building block costs, and therefore allowed revenues, for the subsequent regulatory period.

Within scope of the regulated service?

97. The battery in this scenario is being used by the consumer to reduce its energy bill (by optimising time of use). In this case the supplier/ EDB is not doing anything in relation to the batteries that is part of providing the service of conveying electricity by line. Any effects on the service of conveying electricity by line (ie, on the distribution network), such as deferring capex or reducing transmission charges are unintended.

98. So the battery in this scenario cannot be seen as part of the service of conveyance of electricity by line (and is not regulated as such). It is not necessary to consider whether any exceptions under s 54C(2) apply, given the supplier is not using the battery as part of the service of conveyance of electricity by line.

99. In summary, the battery and its use is unregulated under Part 4.

Costs

100. The capital costs associated with this investment are those of purchasing and commissioning the battery. They are incurred by the consumer. However, the EDB also incurs the costs of purchasing the battery *before* on-selling it.

101. The operating costs associated with this investment are the retail energy purchases. They are incurred by the consumer. They are lower than before the battery was installed.

Revenue streams

102. The revenue streams in this scenario are: (1) the one that the EDB receives from selling the battery to the consumer; and (2) the one resulting from any potential injection back into the grid from the battery.

103. So what is the regulatory treatment of the costs and revenues in this scenario? We answer this in box 3 below.

Box 3: Regulatory treatment of costs and revenues in scenario 2
As explained above, the battery and its use is unregulated.

Treatment of capital costs

Is the asset used for the service of conveyance of electricity by line? No. The capital costs (incurred by the consumer) are not taken into account in our regime. The EDB also incurs the costs of purchasing the battery *before* on-selling it. These last costs are incurred in the supply of an unregulated service (ie, retailing batteries), so they are not added to the RAB.

Treatment of operating costs

Are the operating costs attributable to the service of conveyance of electricity by line? No. The operating costs (incurred by the consumer) are unregulated.

Treatment of revenues

Are the revenues attributable to the service of conveyance of electricity by line? No. The revenues (received by the EDB) are unregulated. Also, the potential revenues received by the consumer are unregulated.

Scenario 3 – EDB-owned and controlled battery on the consumer's premises

Overview

104. An EDB buys and installs a domestic battery beyond the point of supply (ie, behind the meter) in the consumer's premises.

105. The EDB owns and controls the battery. It controls it to achieve two objectives: reducing the consumer's energy bill (similar to how the consumer uses it in scenario 2), and to achieve network benefits (similar to how the EDB uses it in scenario 1). When these objectives conflict, the EDB prioritises the former.

106. There is a contract. The consumer agrees to host the battery in its house and make monthly lease payments in exchange for a commitment from the EDB that it will operate the battery in such a way to reduce the consumer's energy bill by more than the monthly lease payment, and reduce the likelihood of supply disruptions.[32]

107. Similarly to scenario 2, the EDB charges the battery when retail electricity prices are low and discharges it when these prices are high. We make the following assumptions:

    107.1 The consumer is on a time-of-use tariff offered by its retailer.[33]

[32] In order to fulfil its contractual commitment, the EDB can choose to transfer some of the network benefits to the consumer (eg, by reducing the monthly lease payment in a particular month(s)).

[33] Under the terms and conditions of the contract, the consumer agrees that the bill savings will be dependent on its choice of retail tariff. For example, if the consumer switches to a non-time-of-use retail

107.2 In the event of a failure in the EDB's network, the battery would maintain the consumer's electricity supply to the extent it is charged.

Uses of the battery

108. **Reduce bill by optimising time of use**: The EDB operates the battery to reduce the consumer's electricity bill by optimising the timing of sourcing electricity from the grid. This is the overriding objective that determines how it operates the battery.

109. **Avoid/defer capital expenditure**: The EDB operates the battery to meet peak electricity demand when this does not conflict with reducing the consumer's bill.[34] This scenario assumes that, when the EDB can control enough domestic batteries, this is a cost effective alternative to upgrading the distribution network with 'traditional' solutions, so the EDB incurs lower capex than would otherwise be the case.

110. **Improve reliability**: The EDB also uses the battery to avoid supply interruptions to the consumer in the event of a failure in its network. Since the battery maintains the consumer's electricity supply (to the extent charged), this improves the level of service experienced by the consumer. This improvement in service may also benefit the distributor to the extent that it was reflected in the reliability figures reported for compliance purposes and for determining incentive amounts due under the quality of service scheme.[35]

111. **Reduce transmission charges**: The EDB operates the battery to reduce transmission charges (like in scenario 1) when this does not conflict with reducing the consumer's bill.[36] This scenario assumes that, when the EDB can control enough domestic batteries, the potential to reduce transmission charges becomes more significant.

112. **Potential unregulated services**: This scenario assumes that the EDB could aggregate domestic batteries under its control to deliver at least one unregulated service. This could be selling ancillary services to the system operator (eg, instantaneous reserves), among potentially others as long as this does not conflict with reducing the consumer's bill.[37] For the purpose of this scenario, it suffices to say that the EDB uses the battery for at least one unregulated service, and there are revenues associated with this unregulated service.

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tariff, the battery's ability to reduce the consumer's bill by optimising the timing of energy consumption would be reduced. Therefore, the bill savings would be lower, if any.

34 There should be no conflict where the time-of-use tariff driving the charging/discharging decisions is structured in such a way that the 'peak retail price' is aligned with peak demand in the EDB's network.

35 Changes may be required to the regulatory definitions related to SAIDI and SAIFI. That issue is not covered in this paper.

36 There should be no conflict where the time-of-use tariff driving the charging/discharging decisions is structured in such a way that the 'peak retail price' is aligned with 'peak transmission price' faced by the EDB.

37 Subject to any applicable legal restrictions.

Within scope of the regulated service?

113. For the same reasons as scenario 1, the battery is being used to avoid/defer capex, improve reliability, and reduce transmission charges by the supplier/EDB. Therefore, it is being used as part of the service of conveying electricity by line.

114. While the battery is located on the consumer's premises the EDB owns and controls the battery, so it is being used as part of the service of conveyance of electricity by line.

115. We do not see any exceptions in s 54C(2) applying. Even though the battery in this location might be considered to be on a small scale, it is being used for the wider distribution network, and is connected to the grid. Therefore, we do not think it would come within any exceptions for smaller scale distribution networks.

116. As a result we consider that what the supplier is doing with the battery can be considered part of the regulated service.

117. In addition, the supplier uses the battery to provide other services that are not part of the service of conveyance of electricity by line.

Costs

118. The capital costs associated with this investment are those of purchasing and commissioning the battery. They are incurred by the EDB.

119. The operating costs associated with this investment are the retail energy purchases. They are incurred by the consumer. They are lower than before the battery was installed.

Revenue streams

120. Excluding line charges resulting from the application of the building blocks, the EDB has three revenue streams associated with this investment:

    120.1 Monthly lease payments from the consumer.

    120.2 Uplift to its allowed revenue from the quality incentive scheme, driven by an improvement in the EDB's quality performance.[38]

    120.3 Revenue from the unregulated services that the battery allows the EDB to deliver.

121. So what is the regulatory treatment of the costs and revenues in this scenario? We answer this in box 4 below.

[38] The EDB could also receive additional revenue from the energy efficiency and demand side management incentive, depending on how the battery is used.

Box 4: Regulatory treatment of costs and revenues in scenario 3

As explained above, some of the *uses* the EDB is making of the battery can be considered part of the regulated service.

Treatment of capital costs

Is the asset used for the service of conveyance of electricity by line? Yes, the battery is used to provide the service of conveying electricity by line. It is also used to provide unregulated services. Therefore, the EDB must apply the cost allocation IM to allocate the capital costs of the battery. If the materiality thresholds are not reached, the EDB can use ACAM and so allocate *all* the non-avoidable capital costs of the battery to the regulated service (ie, add them to the RAB). Otherwise, the EDB must use ABAA for the allocation (unless this would unduly deter the investment, in which case it may elect to use OVABAA), which would result in a greater proportion of the capital costs being allocated to the regulated service than under ABAA.

Treatment of operating costs

Are the operating costs attributable to the service of conveyance of electricity by line? The EDB does not incur any operating costs associated with the battery. If there were, the EDB would have to apply the cost allocation IM to allocate the operating costs of the battery. The process is the same as for the capital costs, except that the materiality thresholds are different.

Treatment of revenues

Are the revenues attributable to the service of conveyance of electricity by line? Yes, but only partially. The treatment of the capital and operating costs of the battery described above will impact the allowed revenue which the EDB recovers through line charges. In addition, the EDB will receive three revenue streams. Here is how they are treated:

- Monthly lease payments from the consumer: this revenue is attributable to the service of conveyance of electricity by line. Therefore, it is treated as capital contributions (ie, netted off the RAB) as long as it meets the definition of capital contributions.
- Uplift to its allowed revenue from the quality incentive scheme: this is additional revenue for the EDB, driven by an improvement in its quality performance (which is attributable to the service of conveyance of electricity by line).
- Potential additional revenues from unregulated services: these revenues are not attributable to the service of conveyance of electricity by line. Therefore, they are unregulated.

Summary of key points

122. This section presents some key points that emerge from the paper. They relate to the concerns raised by stakeholders around the flexibility of the rules and on the extent to which they provide a 'level playing field' between regulated and unregulated services (see paragraphs 13 to 15 above).

The IMs play an important – yet only partial – role in determining the regulatory treatment of revenues and costs

123. The asset valuation IM and the cost allocation IM are the two key IMs related to the treatment of costs and revenues from emerging technologies. Other legislative provisions (eg, definition of electricity lines service) and other decisions (eg, incentives introduced when resetting a price-quality path) are also relevant.

124. The asset valuation IM[39] sets out the rules on what *types* of assets may be included in the RAB.

125. The cost allocation IM[40] specifies rules for determining the *proportion* of the capital costs (ie, asset values) and operating costs that may be allocated to the regulated service (ie, electricity lines service), and therefore may be included for the purposes of determining the maximum allowable revenue.

The IMs attempt to balance flexibility and prescription

126. The approach behind the asset valuation IM is to put the onus on EDBs to determine whether an asset is used to provide electricity lines services. If it is used to provide electricity lines services, its capital cost may be included (not necessarily in its entirety) in the RAB.

127. The cost allocation IM provides some flexibility in outcomes through the choice of different approaches under certain circumstances. At the same time, it specifies the rules and processes for determining the circumstances in which each approach should apply.

The cost allocation IM must not unduly deter investment by EDBs in other goods and services

128. The total cost of supplying two or more types of services in combination is often lower than if the same services are provided independently. The resulting cost reductions represent efficiency gains associated with joint supply. Therefore an appropriate allocation of shared costs should benefit consumers of both regulated and unregulated services.

129. The role of the cost allocation IM is to ensure that consumers of the regulated service benefit from these efficiency gains, while at the same time not unduly deterring investment by a supplier of regulated services in the provision of other services, as required by s 52T(3) of the Commerce Act.

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39 *Electricity Distribution Services Input Methodologies Determination 2012,* Part 4, subpart 2.

40 *Electricity Distribution Services Input Methodologies Determination 2012,* Part 4, subpart 1.

130. Where the materiality thresholds are exceeded (ie, the scale of the unregulated activity is 'material'), the cost allocation IM requires EDBs to use the ABAA methodology. However, if the EDB considers that the application of ABAA would deter investment in the unregulated services(s), then it has the option of applying OVABAA. This gives the opportunity to move a greater proportion of the shared costs from the unregulated to the regulated service. See Appendix 2 for further details.

131. Where the materiality thresholds are not exceeded, the cost allocation IM allows regulated suppliers to use ACAM, and so allocate to the regulated service some of the costs that would otherwise have been allocated to the unregulated service.

132. In summary, Part 4 does not directly promote the 'level playing field' submitters have referred to in relation to unregulated services.

Questions

133. This section presents several questions that we welcome stakeholder views on. These views should help define the problem relating to the regulatory treatment of the costs and revenues associated with emerging technology (ie, 'non-traditional) investments in the electricity distribution sector.

Opening question

134. Do you agree with the contents of this paper? If not, what aspects do you not agree with?

Questions on the current IMs and approach

135. Do you think the current approach of relying on EDBs to determine if what they are doing is part of the electricity lines services is appropriate? In practice this means determining whether:

    135.1 an asset is used to provide the service; or

    135.2 *operating costs are attributable* in whole or in part to provision of the service?

136. Do you think that the flexibility provided by the availability of three different cost allocation methodologies is appropriate?

137. Do you think that the materiality thresholds for determining which cost allocation methodology should be employed are appropriate?

138. Do you think that the rules and processes for determining the circumstance in which OVABAA can be employed are appropriate?

139. Do you think that the definition of capital contributions is appropriate?

Other questions

140. Are you aware of any revenues/costs that are currently treated as regulated (unregulated) when they *may not* and/or *should not* be?

141. Are you aware of any EDB prices that bundle charges for both regulated and unregulated services, or reasons why such bundled charges might be offered in future?

142. Are you aware of any arrangement where revenue from the supply of electricity lines services would be best treated as capital contributions?

143. Do you think that additional R&D or innovation incentives are needed? And if so, what?

How you can provide your views

144. We welcome stakeholder views. The deadline for written submissions is 5pm on Thursday 4 February 2016. However, we encourage stakeholders attending the workshop to express their view on the above or other questions/issues at the workshop.

145. We also encourage stakeholders to send us questions you may have in respect of this paper in advance of the 14 December workshop. While we may not have answers to all of them at the workshop, it can help us focus the discussion on those issues stakeholders find important.

Address for submissions

146. Submissions should be addressed to:

Keston Ruxton (Manager, IM Review)

c/o regulation.branch@comcom.govt.nz

Format for submissions

147. We prefer submissions in both MS Word and PDF file formats.

148. Please include "Submission on Emerging technology pre-workshop paper: 30 November 2015" in the subject line of your email.

Requests for confidentiality

149. We encourage full disclosure of submissions so that all information can be tested in an open and transparent manner, but we offer the following guidance.

149.1 If it is necessary to include confidential material in a submission, both confidential and public versions of the submission should be provided.

149.2 The responsibility for ensuring that confidential information is not included in a public version of a submission rests entirely with the party making the submission.

150. We request that you provide multiple versions of your submission if it contains confidential information or if you wish for the published electronic copies to be 'locked'. This is because we intend to publish all submissions and cross-submissions on our website. Where relevant, please provide both an 'unlocked' electronic copy of your submission, and a clearly labelled 'public version'.

A1 Appendix 1

Statutory provisions relevant to considering the scope of the regulated service

Commerce Act 1986 – excerpt of provisions

52 Overview of Part

This Part provides for the regulation of the price and quality of goods or services in markets where there is little or no competition and little or no likelihood of a substantial increase in competition.

52A Purpose of Part

(1) The purpose of this Part is to promote the long-term benefit of consumers in markets referred to in section 52 by promoting outcomes that are consistent with outcomes produced in competitive markets such that suppliers of regulated goods or services—

(a) have incentives to innovate and to invest, including in replacement, upgraded, and new assets; and

(b) have incentives to improve efficiency and provide services at a quality that reflects consumer demands; and

(c) share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices; and

(d) are limited in their ability to extract excessive profits.

(2) In this Part, the purpose set out in subsection (1) applies in place of the purpose set out in section 1A.

54C Meaning of electricity lines services

(1) In this subpart, unless the context otherwise requires, **electricity lines services**—

(a) means the conveyance of electricity by line in New Zealand; and

(b) with respect to services performed by Transpower, includes services performed as system operator.

(2) However, none of the following are electricity lines services:

(a) conveying electricity solely for the supplier's own consumption or for the consumption of the supplier's associates:

(b) conveying electricity only from a generator to the national grid or from the national grid to a generator:

(c) conveying electricity (other than via the national grid) only from a generator to a local distribution network or from a local distribution network to a generator:

(d) conveying electricity by lines that are not connected, directly or indirectly, to the national grid:

(e) conveying electricity only by a line or lines that are mostly in competition with a line or lines operated by another supplier of electricity lines services that is not an associate of the person, provided that the competition is actual competition and not potential competition:

(f) conveying electricity if the total circuit length of all of the prescribed voltage electric lines provided by the supplier (or over which electricity is conveyed by the supplier, as the case may be) is less than 25 kilometres:

(g) conveying electricity if the total amount of electricity conveyed to consumers by the supplier is less than 20 gigawatt hours per annum:

(h) conveying electricity if the total number of consumers to whom the supplier conveys electricity is less than 500.

(3) The prescribed voltage electric lines, the electricity conveyed, or the number of consumers to whom electricity is conveyed, when measured in relation to a supplier include, for the purposes of subsection (2)(f) to (h), the lines provided by, electricity conveyed by, or number of consumers of, any associate of the supplier.

(4) In this section, unless the context otherwise requires,—

associate has the same meaning as in section 73 of the Electricity Industry Act 2010

consumer has the same meaning as in section 2(1) of the Electricity Act 1992

lines has the same meaning as in section 2(1) of the Electricity Act 1992

national grid has the same meaning as in section 5 of the Electricity Industry Act 2010

prescribed voltage electric line means a line that is capable of conveying electricity at a voltage equal to or greater than 3.3 kilovolts.

54E Electricity lines services declared to be regulated

Electricity lines services are regulated under this Part.

Electricity Act 1992 - excerpt of provisions

2 – Interpretation

electrical installation—

(a) means—

(i) in relation to a property with a point of supply, all fittings beyond the point of supply that form part of a system that is used to convey electricity to a point of consumption, or used to generate or store electricity; and

(ii) in relation to a property without a point of supply, all fittings that form part of a system that is used to convey electricity to a point of consumption, or used to generate or store electricity; but

(b) does not include any of the following:

(i) an electrical appliance:

(ii) any fittings that are owned or operated by an electricity generator and that are used, designed, or intended for use in or in association with the generation of electricity, or used to convey electricity from a source of generation to distribution or transmission lines:

(iii) 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

lines means works that are used or intended to be used for the conveyance of electricity

***works*—**

(a) means any fittings that are used, or designed or intended for use, in or in connection with the generation, conversion, transformation, or conveyance of electricity; but

(b) does not include any part of an electrical installation

Electricity Industry Act 2010 - excerpt of provisions

105 Continuance of distributors' supply obligation

(1) This section applies to a distributor who, in relation to any place,—

(a) is, immediately before the repeal by this Act of section 62 of the Electricity Act 1992, prohibited from ceasing to supply line function services to the place without the prior consent of either the Minister or every consumer who would be affected by the cessation of those services; or

(b) is the successor in business to a distributor referred to in paragraph (a).

(2) A distributor to whom this section applies must, in relation to the place referred to in subsection (1), either—

(a) supply line function services to the place so that the place is within the distributor's network; or

(b) supply the place with electricity from an alternative source.

(3) The obligation in subsection (2) is subject to anything to the contrary in the Electricity Act 1992, any regulations made under section 169 of that Act, or any written agreement, entered into before this section comes into force, between the distributor and a landowner who is, or would be but for the agreement, affected by the obligation.

(4) A distributor who is obliged under subsection (2) to supply line function services or electricity from an alternative source to a place commits an offence, and is liable on conviction to a fine not exceeding $10,000 and to a further fine not exceeding $1,000 for every day or part of a day during which the offence continues, if the distributor,—

(a) having been made aware that supply to the place has ceased in the circumstances described in section 106(2)(a), fails to resume supply as soon as is reasonable in the circumstances; or

(b) knowingly ceases to supply line function services or electricity (as the case may be) to the place, other than in the circumstances described in section 106(2)(b) or (c).

(5) In this section and sections 106 to 108,—

landowner, in relation to a place, means a person who owns the lines or electrical installations at the place, being lines or electrical installations to which a distributor's lines are connected

supplying electricity from an alternative source means supplying a place with electricity from a source other than a distributor's network, and includes, if necessary, supplying the associated line function services to deliver that electricity.

108 Application of other enactments

(1) Any obligations under the following that apply to retailers apply to a distributor in connection with any supply by the distributor of electricity from an alternative source, if that supply is in fulfilment of the supply obligation in section 105(2):

(a) obligations under this Act, the regulations, and the Code:

(b) obligations under the Electricity Act 1992 and any regulation made under that Act.

(2) However, regulations made under section 113 about low fixed charge tariff options do not apply to a distributor in respect of consumers to whom the distributor supplies electricity from an alternative source.

(3) If a distributor, during a trial or transition in the course of complying with section 105(2), both supplies a place with line function services that connect the place to a network and, at the same time, supplies the place with electricity from an alternative source, the distributor is not to be treated as thereby being involved in generation or retailing for the purposes of Part 3.

(4) For the purposes of subpart 9 of Part 4 of the Commerce Act 1986, the Commerce Commission must treat the costs of providing electricity to a place from an alternative source, and any cost arising in respect of a place from an agreement under section 106(1)(a), as if the costs were the cost of providing electricity lines services (as defined in section 54C of the Commerce Act 1986).

A2 Appendix 2

The cost allocation IM: a summary

A2.1 This appendix summarises the cost allocation IM. It aims to inform stakeholders participating in the emerging technology workshop on 14 December 2015. It should not be relied upon for decision making. Stakeholders should refer to the main IM determination[41] and reasons paper[42] for the full details.

A2.2 This appendix answers the following questions:

a. Why do we need a cost allocation IM?

b. What is the cost allocation IM designed to achieve?

c. What does the cost allocation IM actually say?

d. How does the cost allocation IM delivers its objectives?

e. How does the cost allocation IM work in practice? A worked example.

Why do we need a cost allocation IM?

A2.3 For two main reasons: (1) because some suppliers provide more than one service, which implies they must allocate common or shared costs[43] between these services; and (2) there are statutory requirements on us to specify an IM for cost allocation.

Because suppliers provide several services

A2.4 Many suppliers provide both regulated services (eg, electricity distribution services, gas distribution services, and gas transmission services) and unregulated services (eg, tree cutting unrelated to electricity lines safety clearances). This means that suppliers must allocate shared costs between these services.

A2.5 The total cost of supplying two or more types of services in combination is often lower than if the same services are provided independently. The resulting cost reductions represent efficiency gains associated with joint supply. To the extent that regulated suppliers benefit from these efficiency gains (eg, through higher profitability over the short to medium term), they have an incentive to provide multiple services. Also, to the extent that consumers benefit from these efficiency gains (eg, through lower prices and or better quality over the medium to long term), it is in consumers' interests that suppliers provide multiple services.

A2.6 However, it does not follow that consumers of *regulated* services will necessarily benefit from these efficiency gains. It is these consumers of regulated services that

41 http://www.comcom.govt.nz/dmsdocument/13113

42 http://www.comcom.govt.nz/dmsdocument/6499

43 The term "common costs" is undefined in the Act and has a number of possible meanings. We use the more general term "shared costs" when referring to costs that are common to two or more services.

the Commission is concerned with. In fact, suppliers often have an incentive to allocate shared costs to the regulated service, since full cost recovery can be more certain. Therefore, without cost allocation rules, consumers of regulated services risk being disadvantaged by bearing a higher proportion of shared costs (and therefore higher prices) than would be the case if the service was provided in a competitive market.

Because of statutory requirements

A2.7 The main statutory requirements relevant to the cost allocation IM include:

a. section 52T(1)(a)(iii) requires us to include in an IM for evaluation or determining allocation of common costs, including between activities, businesses, consumer classes, and geographic areas;

b. section 52A(1)(b) requires that we promote incentives for suppliers to improve efficiency;

c. section 52A(1)(c) requires that suppliers share with consumers the benefits of efficiency gains, including through lower prices;

d. section 52T(3) requires that any cost allocation methodology we determine must not unduly deter investment by a supplier of regulated services in the provision of other services.

What is the cost allocation IM designed to achieve?

A2.8 There are two main objectives behind the cost allocation IM: (1) to promote incentives for suppliers to improve efficiency, and (2) to ensure that suppliers share with consumers of regulated services the benefits those efficiency gains. A third consideration is to balance the certainty that comes with prescription with the flexibility needed to take into account differences between suppliers' businesses.

Improve efficiency

A2.9 Efficiency improvements in this context mainly occur through diversification, when a supplier uses existing operations and assets to supply other types of services and achieve economies of scope.

A2.10 In workably competitive markets, the incentive to diversify arises by the prospect that a supplier has of earning above-normal returns over the period in which none of its competitors supply the same expanded mix of services. It can earn above-normal returns because the economies of scope may provide the supplier with a temporary cost advantage over its competitors, while it can charge (up to) the same level of prices.

A2.11 Since the source of efficiency gains in this context is diversification, the role of the cost allocation IM is not to unduly deter investment by a supplier of regulated services in the provision of other services.

Share efficiencies with consumers

A2.12 Once the efficiencies have been achieved, the next question is how they are split between consumers and suppliers, and over what timeframe.

A2.13 In workably competitive markets, the competitive process leads to the benefits of efficiency gains initially realised by the firm in the form of above-normal profits being shared with consumers over time. This happens in the form of lower prices, better quality or both, as competitors imitate the business model of the firm that first succeeded in achieving the economies of scope. In the process, they will compete away the above-normal returns by, for example, biding down the price of the service, therefore benefiting consumers. The speed with which competitors react will generally determine the time when consumers benefit from the efficiency gains. The price sensitivity of consumers of a given service will generally determine the extent to which they benefit from the efficiency gains.

A2.14 As mentioned, suppliers often have an incentive to allocate shared costs to the regulated service, since full cost recovery can be more certain, resulting in higher prices for the regulated service than would otherwise be the case. Therefore, absent any cost allocation rules, it is likely that consumers of the regulated service would not benefit from the efficiency gains to the same extent as they would in a workably competitive market.

A2.15 The cost allocation IM enables consumers of regulated services to share in any benefits from efficiency gains, over time. It does so by requiring suppliers to follow certain cost allocation methodologies to ensure that shared costs allocated to the regulated service are not unduly high. We apply the IM through the regulatory instruments such that suppliers can benefit from efficiency gains in the short-to-medium term (ie, during the price control period, and into the next period through the application of the IRIS mechanism); while consumers share in the benefits in the medium-to-long term (ie, once we reset price-paths).

Provide sufficient flexibility to cater for suppliers' different business models

A2.16 The purpose of IMs is to promote certainty for suppliers and consumers in relation to the rules, requirements and processes applying to regulation under Part 4 (s 52R). A highly prescriptive IM needs to be balanced against flexibility to take into account differences between suppliers' businesses in order to bring outcomes closer to those in workably competitive markets. While some flexibility in outcomes is provided by the cost allocation IM, through the choice of different approaches under certain circumstances, the rules and processes for determining the circumstances in which each approach should apply are specified.

What does the cost allocation IM actually say?

Definitions

A2.17 Key definitions in the cost allocation IM are:

a. OCDA: operating costs directly attributable;

b. AVDA: regulated service asset values directly attributable;

c. OCnDA: operating costs not directly attributable;

d. AVnDA: regulated service asset values not directly attributable;

e. ABAA: accounting-based allocation approach;

f. OVABAA: optional variation to the accounting-based allocation approach;

g. ACAM: avoidable cost allocation methodology.

Requirements

A2.18 The IM requires suppliers to take a two-step allocation process:

a. Step 1: allocate OCDA and AVDA to the respective regulated services (eg, electricity distribution service) they are wholly and solely attributable to.

b. Step 2: allocate OCnDA and AVnDA to the regulated services they are associated with using the ABAA. However, suppliers **may** instead choose to allocate these costs to the regulated service using one of the below methodologies provided it satisfies the following conditions:

i. If revenues from the supply of unregulated services are less than 20% of revenues from regulated services:

- Then OVABAA or ACAM may be applied to allocate OCnDA and AVnDA;

If the above revenue materiality screening threshold is exceeded, the supplier must proceed to assess OCnDA and AVnDA:

ii. If OCnDA less any arm's length deduction are less than 15% of operating costs:

- Then OVABAA or ACAM may be applied to allocate OCnDA;

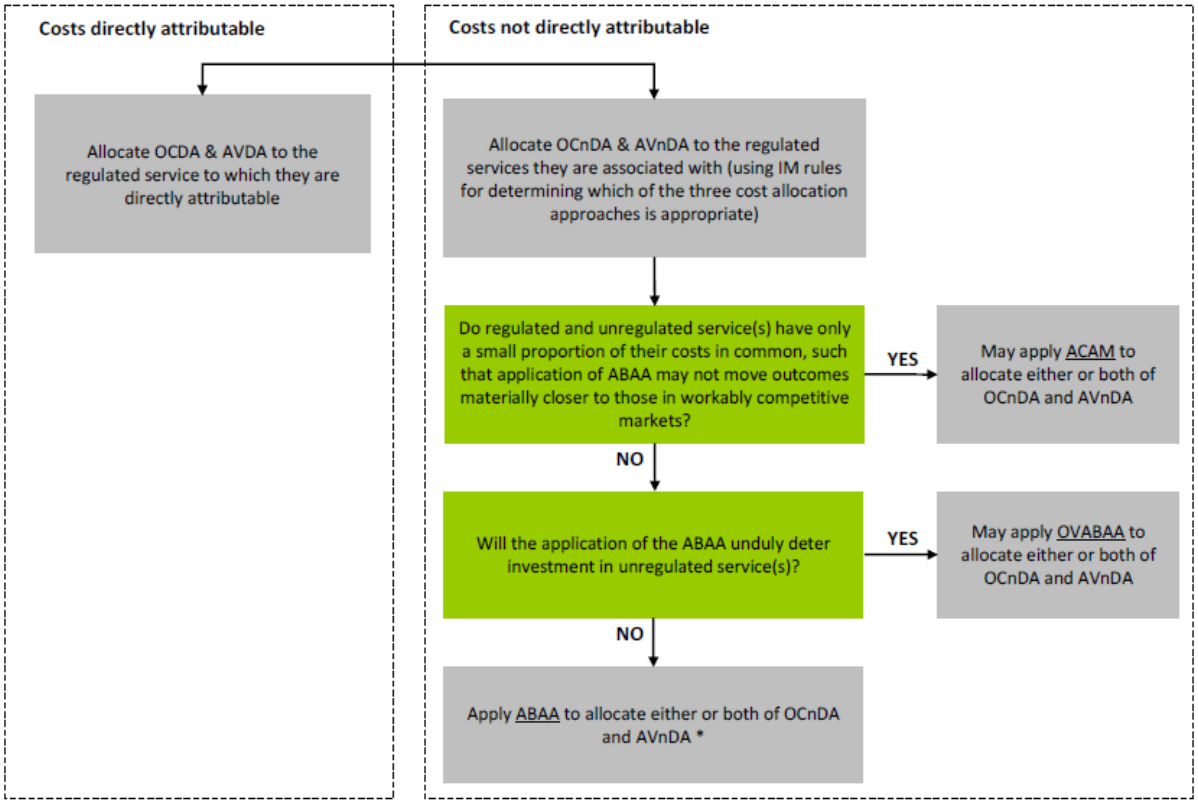
iii. If AVnDA less any arm's-length deduction is less than 10% of the aggregated unallocated closing RAB:

- Then OVABAA or ACAM may be applied to allocate AVnDA;

In all other cases, ABAA or OVABAA, at the supplier's election, must be applied to allocate OCnDA and/or AVnDA.

A2.19 Figure A2.1 below illustrates the process.

Figure A2.1: Overview of the cost allocation process



Note: * Regulated suppliers may at any time choose to apply ABAA to allocate either or both of OCnDA and AVnDA.

The different cost allocation approaches in a nutshell

A2.20 **Allocation of costs directly attributable (CDA)**: allocates operating costs and asset values that are wholly and solely associated with the provision of regulated services to the services to which they are directly attributable.

A2.21 **Allocation of costs not directly attributable (CnDA)**: allocates operating costs and asset values that are associated with the provision of regulated or both regulated services and unregulated services to the regulated services they are associated with. This is undertaken based on rules that determine the circumstances in which the application of each of the three approaches set out below is appropriate.

A2.22 **Accounting-based allocation approach (ABAA)**: allocates operating costs and asset values based on causal factors, or based on proxy factors where causal-based allocators are not available. This approach ensures an allocation of shared costs across all types of services and in many circumstances is expected to move the allocation of shared costs closer to those in workably competitive markets than when applying ACAM, which results in all shared costs being allocated to the regulated services.

A2.23 **Optional variation to the accounting-based allocation approach (OVABAA)**: it gives the option to achieve a greater recovery of shared costs from regulated services in the short (and possibly longer) term than might be achieved through the ABAA. Use of OVABAA is appropriate in those situations where the application of

the ABAA might unduly deter investments in unregulated services. To achieve this allocation, suppliers already need to have allocated costs using the ABAA. This assessment can then be used to justify moving away from the initial cost allocation on the grounds that, if one or more of the unregulated services had to bear the costs implied by such an approach, existing services would be discontinued and/or new services would not be provided, solely due to the application of that approach. Suppliers are required to provide a directors' certificate on the appropriateness of the proposed alternative allocation, and also have to comply with information disclosure requirements.

A2.24 **Avoidable cost allocation methodology (ACAM)**: Where regulated and unregulated services have only a small proportion of their costs in common, the use of either of the above approaches may not move outcomes materially closer to those in workably competitive markets. This is because, where shared costs are not large, an approach that allocates some shared costs to all services (such as the ABAA) may not produce cost allocation outcomes that are materially different from an approach that allocates shared costs only to certain services. In these instances, suppliers may use the avoidable cost allocation methodology (ACAM). Under ACAM, non-avoidable costs of supplying the regulated service may be allocated to the regulated service – ie, any costs that would be avoided if the EDB supplied only the regulated service may not be allocated to the regulated service.[44]

How does the cost allocation IM work in practice? A worked example[45]

A2.25 This section provides a worked example that illustrates the practical application of the cost allocation IM and the process for selecting the appropriate cost allocation approach.

Cost allocation problem and context

A2.26 A hypothetical EDB, 'EDB Ltd', provides electricity distribution and gas distribution services, both of which are regulated under Part 4 of the Act. It also provides two unregulated services, Service A and Service B. EDB Ltd is therefore required to apply the cost allocation IM and produce information disclosure reports for the current regulatory year.

A2.27 The IM requires that any operating costs and regulated service asset values that are directly attributable to electricity distribution services supplied by the EDB must be allocated to those electricity distribution services. It also provides that any OCnDA and AVnDA must be allocated to electricity distribution services and other regulated services using either:

a. accounting-based allocation approach (ABAA);

b. avoidable cost allocation methodology (ACAM); or

[44] Where an EDB supplies other regulated services, ACAM applies across all regulated services and ABAA must be used to allocate costs between regulated services.

[45] Source: Appendix D of "Input Methodologies (EDB and GPB services): reasons paper", December 2010.

c. optional variation to the accounting-based allocation approach (OVABAA).

A2.28 In order to determine whether the EDB is able to apply ACAM to operating costs and regulated service asset values, it must apply materiality screening tests. If the thresholds in these tests are reached or exceeded an EDB should apply the ABAA. The EDB also has the option of applying the OVABAA if it considers that any unregulated services will be unduly deterred. Irrespective of the outcomes of materiality screening tests or OVABAA, the EDB may always elect to apply the ABAA.

A2.29 The remainder of this appendix sets out EDB Ltd's application of the cost allocation process using illustrative data on operating costs and regulated service asset values.

A2.30 EDB Ltd's cost accounting system does not yet fully conform to the ABAA. However, it is relatively straightforward to identify those operating costs and regulated service asset values which are directly attributable and those which are not directly attributable.

A2.31 EDB Ltd calculates that it has incurred $7m worth of OCnDA and $17.5m of AVnDA throughout the current regulatory year.

Materiality Screening Tests

A2.32 The first step in the cost allocation process is for EDB Ltd to allocate OCDA and AVDA to the services to which they are directly attributable.

A2.33 Next, EDB Ltd has to determine which allocation approach to use to allocate OCnDA and AVnDA. It therefore needs to compile the information to undertake the mandated materiality screening tests.[46]

A2.34 Application of the revenue materiality screening test requires information on total unregulated revenues and total regulated revenues. The Commission defines total regulated revenue as that received from the provision of electricity distribution services and any other services regulated under Part 4. For EDB Ltd the regulated revenues are therefore the sum of revenues from its electricity distribution and gas distribution services.

A2.35 The test involves an assessment of whether total unregulated revenue is at least 20% of total regulated revenue. Calculations show that with unregulated revenues of $8m ($5m+$3m), and regulated revenues of $29m ($20m+$9m), EDB Ltd's unregulated revenues reach or exceed the 20% threshold ($8m/$29m=28%).

A2.36 EDB Ltd therefore proceeds to assess the materiality of its OCnDA and AVnDA.

[46] As stated above, materiality threshold testing is optional and a regulated supplier may always to elect to apply the ABAA.

A2.37 Application of the operating cost materiality screening test requires information on total OCnDA and on total operating costs[47] as well as on any operating costs EDB Ltd elects to recover through arm's-length transactions.

A2.38 The test involves an assessment of whether OCnDA, less any deductions of operating costs recovered through arm's-length transactions, are at least 15% of operating costs. EDB Ltd has not entered into any arm's-length transactions and therefore does not make any arm's-length deductions. Calculations show that with OCnDA of $7m, and operating costs of $22m ($10m Electricity OCDA +$5m Gas Distribution OCDA +$7m OCnDA), EDB Ltd's OCnDA exceed the 15% threshold ($7m/$22m=32%).

A2.39 The asset value materiality screening test requires information on AVnDA,[48] aggregated unallocated closing RAB value for all types of regulated services and on any regulated service asset values relating to assets for which EDB Ltd elects to make arm's-length deductions.

A2.40 The test involves an assessment of whether AVnDA, less any voluntary deductions in respect of assets for which capital costs have been recovered through arm's-length transactions, are at least 10% of total aggregated RAB. EDB Ltd has not entered into any arm's-length transactions and therefore does not elect to make any arm's-length deductions. Calculations show that with AVnDA of $17.5m, and aggregated unallocated closing RAB of $97.5m ($60m Electricity regulated service AVDA +$20m Gas Distribution regulated service AVDA +$17.5m AVnDA), EDB Ltd's regulated service AVnDA exceed the 10% threshold ($17.5m/$97.5m=18%).

A2.41 As a result of undertaking these tests, the ABAA should be applied for both operating costs and regulated service asset values. However, on the basis that some investments might be unduly deterred, the EDB may elect to undertake an OVABAA. The application of this is set out in the next section.

Application of Optional Variation to the Accounting-based Allocation Approach

A2.42 EDB Ltd carries out an allocation of OCnDA and AVnDA using cost allocators based on causal factors. The outcome of this allocation is shown in Table D1 below. However, EDB Ltd expects that its investment in unregulated Service B might be unduly deterred as a result of these allocations. It therefore considers that it might not be appropriate for it to base information disclosures on the allocation of costs it achieved using this allocation approach and that it may be more appropriate for it to apply the OVABAA.

[47] Operating cost means expenditure incurred by the EDB in the supply of any type of regulated service and excludes: a cost that is treated as the cost of an asset by GAAP; amounts that are depreciation, tax, subvention payments, revaluations or an interest expense, in accordance with their meanings under GAAP; and pass-through costs or recoverable costs.

[48] Regulated service asset values means, in respect of an asset used in the supply of any type of regulated service, unallocated closing RAB value determined in accordance with the IM Determination applicable to that type of regulated service.

A2.43 The EDB therefore undertakes an assessment of the viability of unregulated Service B based on allocations made to it using the ABAA. EDB Ltd makes this assessment using EBITDA as a measure of profitability and ROI as a measure of return on capital.[49] As shown in bold in Table D1 below, unregulated Service B has an EBITDA of $100k and an ROI of 1%.

Table A1 Outcomes of the ABAA ($000)

	Regulated Services		Unregulated Services		Consolidated
	Electricity	Gas Distribution	Service A	Service B	Total
Revenue	20,000	9,000	5,000	3,000	37,000
OCDA	10,000	5,000	3,000	2,000	20,000
OCnDA using ABAA	2,900	2,000	1,200	900	7,000
EBITDA	7,100	2,000	800	100	10,000
AVDA	60,000	20,000	8,000	7,500	95,500
AVnDA using ABAA	10,000	4,000	1,000	2,500	17,500
Total RAB	70,000	24,000	9,000	10,000	113,000
ROI	10%	8%	9%	1%	9%

Note: OCDA means operating costs-directly-attributable; OCnDA means operating costs-not-directly-attributable; EBITDA means earnings before interest, tax, depreciation and amortisation; AVDA means regulated service asset values directly attributable; AVnDA means regulated service asset values not directly attributable; ROI means return on investment.

A2.44 EDB Ltd's view is that for this reason use of this allocation approach would result in Service B being unduly deterred (ie, Service B will be discontinued or not provided solely as the result of the allocation of OCnDA or AVnDA it is required to bear). It therefore refers to the Commission's rules on the OVABAA.

A2.45 The OVABAA allows EDB Ltd to reduce each or both of operating costs and regulated service asset values allocated to Service B up to the point where its investment in this service is no longer unduly deterred. In doing so, EDB Ltd can reduce costs allocated to Service B only, asset values allocated to Service B only, or any combination of the two. However, aggregated reductions in allocation of costs and assets to Service B should only be made to the extent necessary for the service to become viable. As a minimum, after reallocations made as part of the OVABAA, Service B must bear at least all CDA applicable to that service and all those costs that would be allocated to it if ACAM were applied.

[49] This measure of economic performance is purely chosen for illustrative purposes. In practice, the Commission considers that EDBs may also consider a wider range of economic evidence when determining whether individual unregulated services have been unduly deterred.

A2.46 Following the reduction of OCnDA and AVnDA allocated to Service B, these amounts must be reallocated across the remaining regulated and unregulated services using the same set of cost allocators as used in the original allocation. In practice, this needs to be undertaken by grossing up the cost allocators or asset allocator metrics (which can be reduced, in practice, to proportions of costs to be allocated to each service) to reflect the cost no longer borne by Service B.

A2.47 Using data from the economic assessments it made above, (which in this case are, for simplicity, limited to the considerations of EBITDA and ROI), the EDB considers that Service B can only bear $405k of OCnDA and $1,125k of AVnDA, ie, it elects to make a proportionally equal reduction in each of OCnDA and AVnDA of 55% ($495k/$900k and $1,375k/$2,500k). The OVABAA therefore results in a reduction of OCnDA allocated to Service B of $495k and a reduction of AVnDA allocated to Service B of $1,375k. These figures are shown in Table D2. The OCnDA and AVnDA, less the reduced amount now allocated to Service B under the OVABAA, are now re-allocated across electricity distribution services, gas distribution services and all remaining unregulated services (ie, Service A). This is done by grossing up allocation percentages based on the same set of cost allocators as used in the first allocation carried out. The resulting re-allocations are set out in Table D2.

Table A2 Net Changes from the ABAA to the OVABAA ($000)

	Regulated Services		Unregulated Services		Consolidated
	Electricity	Gas Distribution	Service A	Service B	Total
OCnDA using ABAA	2,900	2,000	1,200	900	7,000
OCnDA using OVABAA	3,136	2,162	1,297	405	7,000
Net change	236	162	97	(495)	-
AVnDA using ABAA	10,000	4,000	1,000	2,500	17,500
AVnDA using OVABAA	10,916	4,367	1,092	1,125	17,500
Net change	916	367	92	(1,375)	-

A2.48 If EDB Ltd considered that further unregulated services might be unduly deterred, it would repeat the process described in paragraphs A2.47 to A2.47 until a cost allocation outcome is reached where the EDB considers that the investment is viable. For the purposes of this worked example it is assumed that this outcome is reached after the first re-allocation.

A2.49 The cost allocation and the desired EBITDA and ROI achieved using the OVABAA are set out in Table D3 below. Following the completion of this process EDB Ltd provides a directors' certification to the Commission to support this allocation.

Table A3 Outcomes of the OVABAA ($000)

	Regulated Services		Unregulated Services		Consolidated
	Electricity	Gas Distribution	Service A	Service B	Total
Revenue	20,000	9,000	5,000	3,000	37,000
OCDA	10,000	5,000	3,000	2,000	20,000
OCnDA using OVABAA	3,136	2,162	1,297	405	7,000
EBITDA	6,864	1,838	703	595	10,000
AVDA	60,000	20,000	8,000	7,500	95,500
AVnDA using OVABAA	10,916	4,367	1,092	1,125	17,500
Total RAB	70,916	24,367	9,092	8,625	113,000
ROI	10%	8%	8%	7%	9%

A3 Appendix 3

Simplified diagrams of the regulatory treatment of key money flows

A3.1 This Appendix 3 has been prepared to assist stakeholders interpret the regulatory treatment of the scenarios outlined in this paper at the emerging technologies workshop on 14 December 2015.

A3.2 The diagrams in Figures A3.1 to A3.5 of this Appendix 3 set out our initial high level suggestion for how stakeholders might think about how money flows (ie, incomes and expenditures) are dealt with for EDBs under the IMs.

A3.3 The aim is that stakeholders will be able to overlay the money flows of an alternative investment scenario on these diagrams and be able to:

a. make an initial interpretation of the regulatory treatment of that investment scenario under the existing IMs; and

b. identify any potential problems with the way the existing IMs apply to that investment scenario.

A3.4 The diagrams in this paper also assume a basic knowledge of the current EDB IM determination.[50] They are not intended to be a complete guide to the relevant IMs. The diagrams are our first step in putting together a set of cross-sector diagrams that show the linkages between the IMs and the way they are intended to be used for information disclosure (ID) and price-quality setting. This first set of diagrams will be published on our web site as MS Outlook slides.

A3.5 Subject to stakeholder feedback we could consider progressively releasing other versions on our web site over the course of the IM Review. As they are somewhat a prototype for design of later diagrams, we welcome any comments on the design and content of these initial diagrams.

A3.6 We will notify stakeholders through our Regulation Branch email notifications when we publish diagrams or other materials that support the IM Review.

How money flows are dealt with for EDBs under the IMs

A3.7 Figure A3.1 shows the high level linkages between the total regulatory income (in Figure A3.2) and the following elements that build up to it:

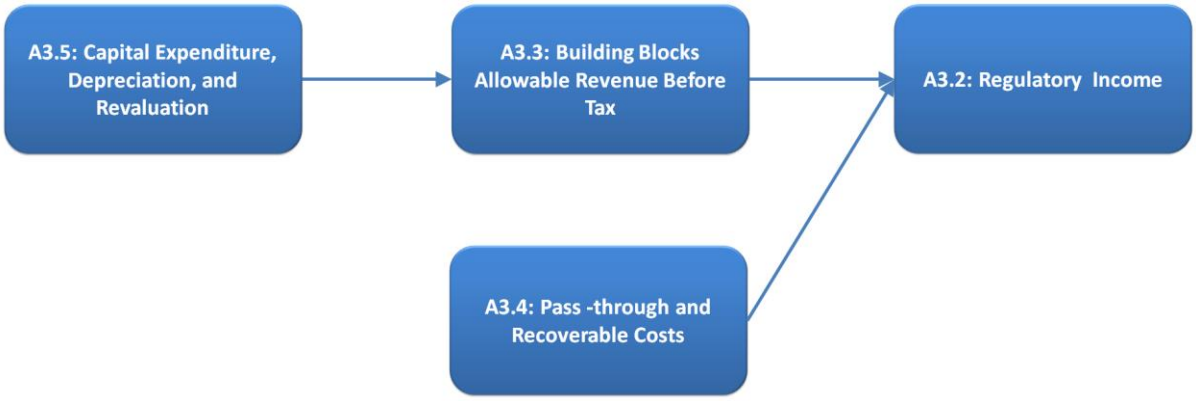
a. Figure A3.3: The building blocks calculation of the maximum allowable revenue (MAR) based on various cost elements and timing factors (see Figure A3.2).

b. Figure A3.4: The pass through costs and recoverable costs that an EDB may recover in addition to the MAR (see Figure A3.3).

[50] *Electricity Distribution Services Input Methodologies Determination 2012*, consolidated as at 11 December 2014.

c. Figure A3.5: The capital expenditure elements such as the value of commissioned assets, depreciation and revaluations, which in turn feed into building blocks in the MAR calculation (see Figure A3.4).

Figure A3.1: Overview of elements in setting and measuring regulatory income



Total regulatory income

A3.8 Figure A3.2 is a high level look at the money flows and regulatory elements that feed into the setting of the total regulatory income. It shows how GAAP-based income numbers on the left hand side of the figure are adjusted under the IMs to come to values which we have styled as 'Part 4 values' that we then apply in setting or measuring the total regulatory income.

A3.9 You will note that we refer for convenience of description in the diagrams to some money flows as 'fast money', by which we mean costs that are incurred in a year and recovered as revenues in roughly the same year. Conversely, by 'slow money' we mean costs that may be incurred over one or more years (for example, in a capex project) and which are recovered as revenues over multiple years (for example, the recovery of the RAB over the asset life).

Building block elements of allowable revenue before tax

A3.10 Figure A3.3 then shows the building block elements that are applied under the IMs in setting a price path. This diagram is based on the EDB CPP building blocks approach in the EDB IMs.[51] We selected the CPP building blocks for this purpose because they are described in more detail in the CPP IMs than the income setting in the DPP IMs.

[51] *Electricity Distribution Services Input Methodologies Determination 2012*, consolidated as at 11 December 2014, part 5, subpart 3, section 1.

Pass-through costs and recoverable costs

A3.11 Figure A3.4 shows the pass-through costs and recoverable costs that are applied in addition to the price path building blocks when we are setting a price path. This diagram is based on the EDB specification of price IMs for DPPs and CPPs.[52]

A3.12 Recoverable costs include some GAAP-based costs and incentive amounts that are not included in the building blocks described in Figure A3.3.

Capital expenditure and the RAB

A3.13 Figure A3.5 shows the capital expenditure elements that are applied in setting some of the values in the building blocks in Figure A3.3. This diagram is based on the EDB asset valuation IMs for DPPs and CPPs.[53]

[52] *Electricity Distribution Services Input Methodologies Determination 2012*, consolidated as at 11 December 2014, part 3, subpart 1.

[53] *Electricity Distribution Services Input Methodologies Determination 2012*, consolidated as at 11 December 2014, part 3, subpart 1.

Figure A3.2: Money flows and regulatory elements feeding into total regulatory income

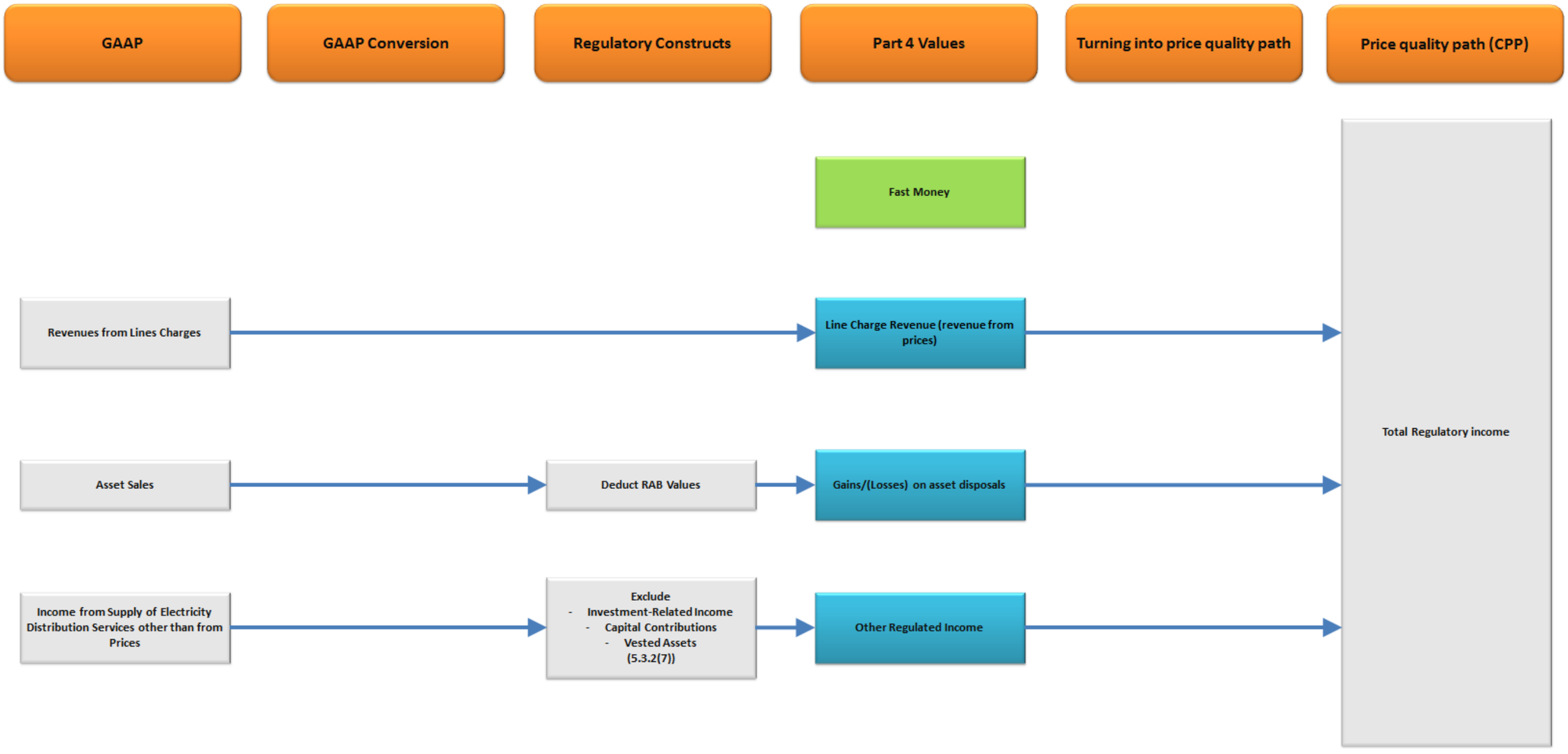


Figure A3.3: Calculation of building blocks allowable revenue before tax

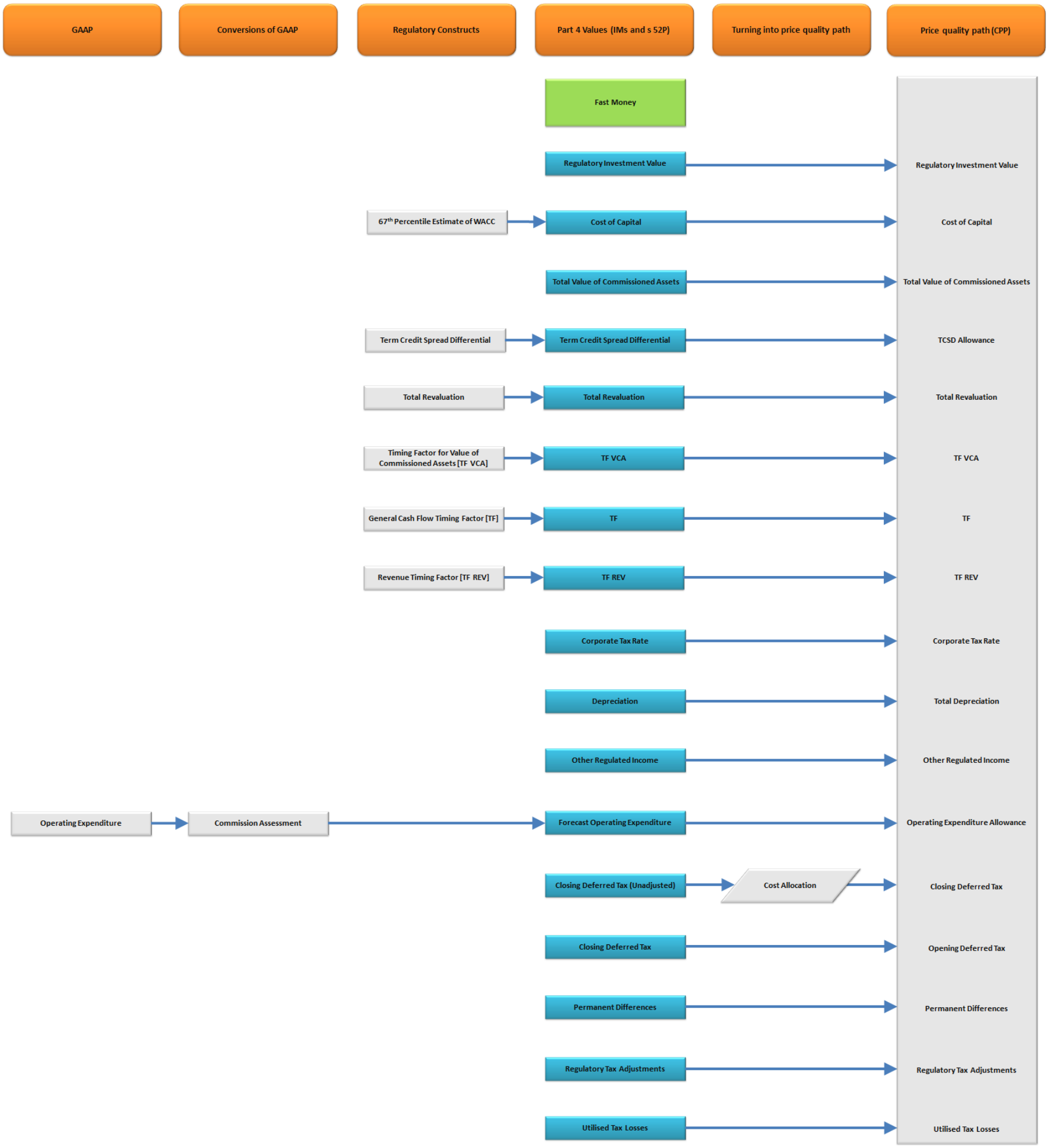


Figure A3.4: Pass-through Costs and Recoverable Costs

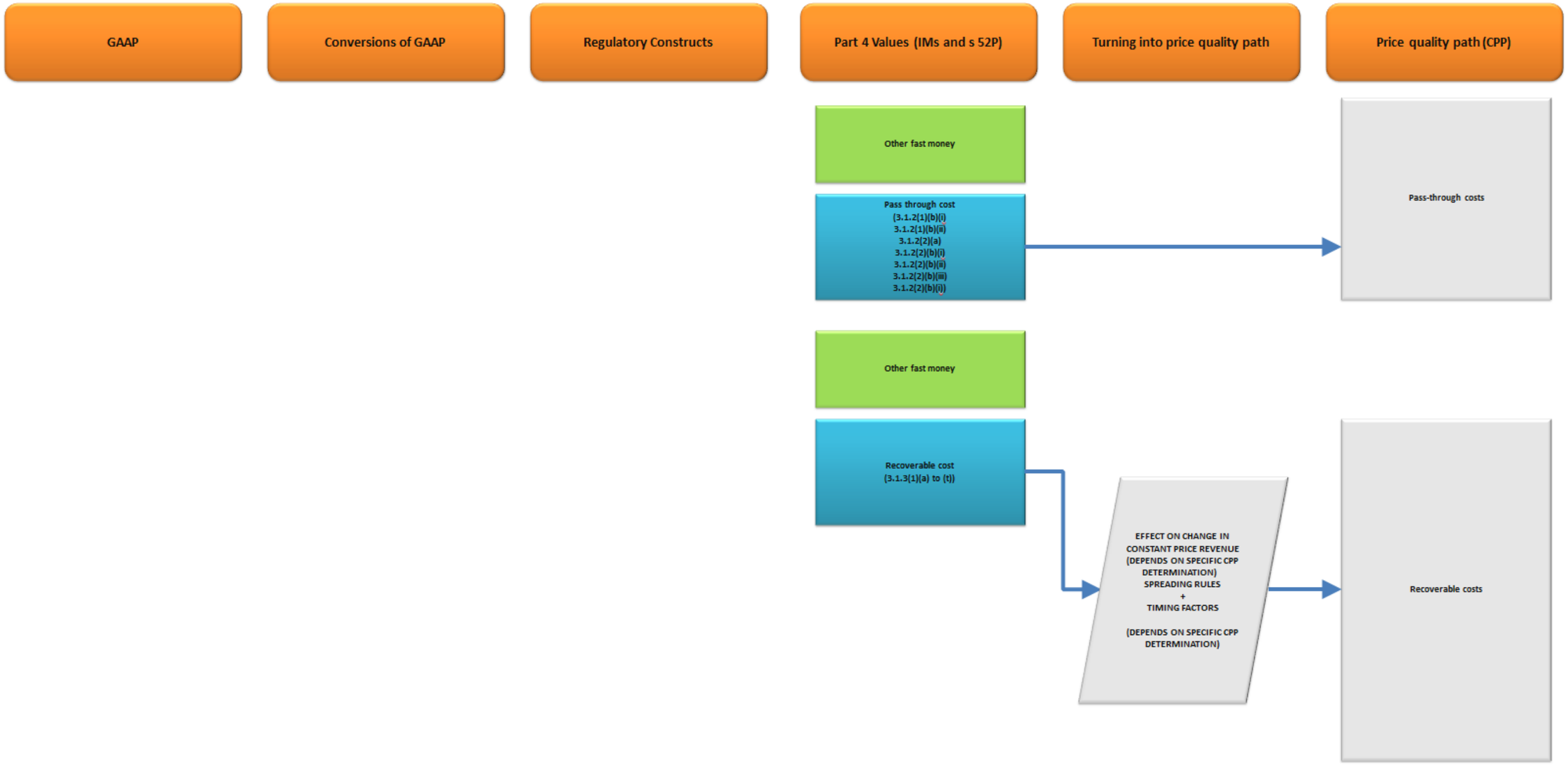
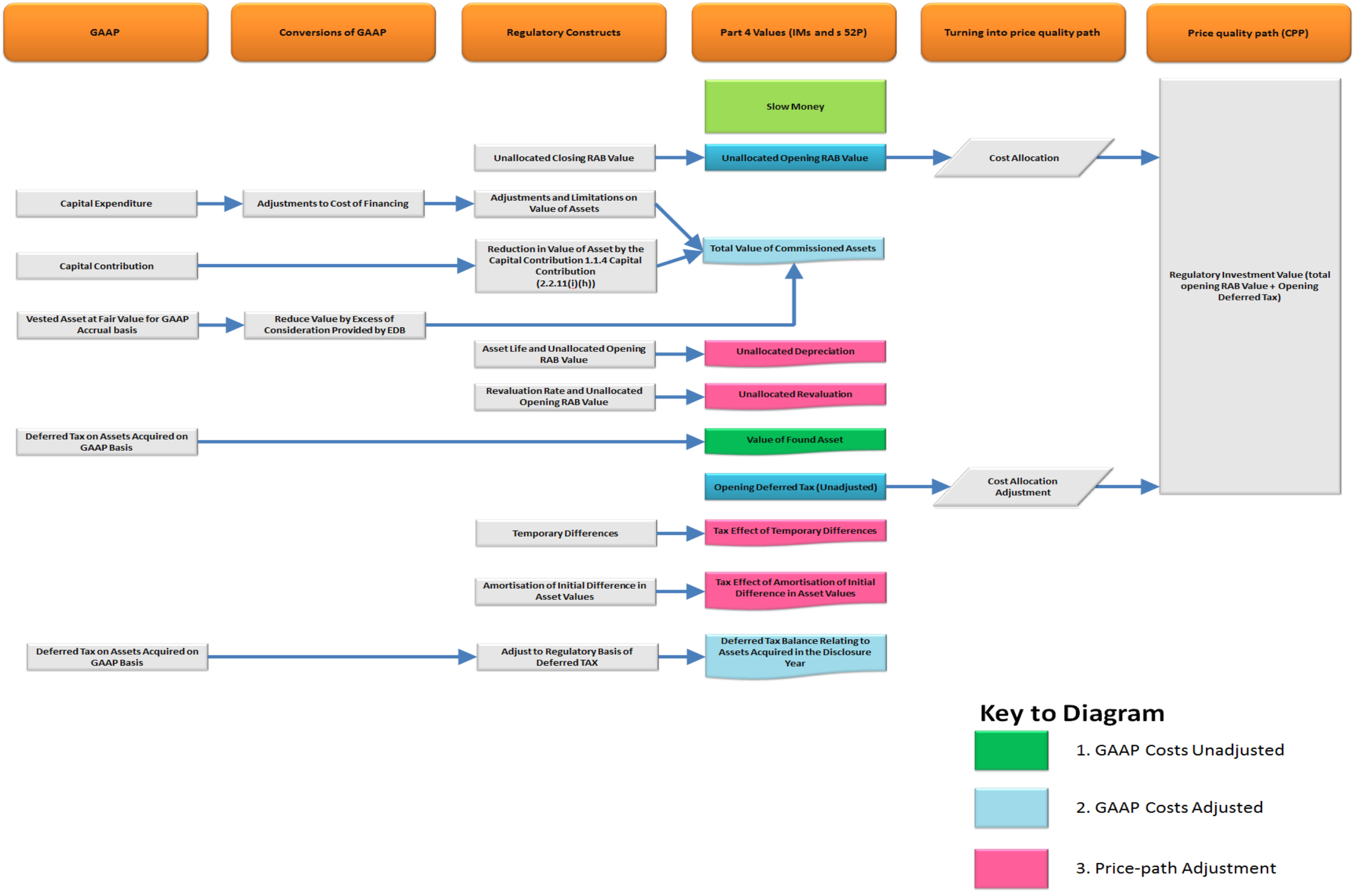


Figure A3.5: Capital expenditure and the RAB



Key to Diagram

1. GAAP Costs Unadjusted
2. GAAP Costs Adjusted
3. Price-path Adjustment