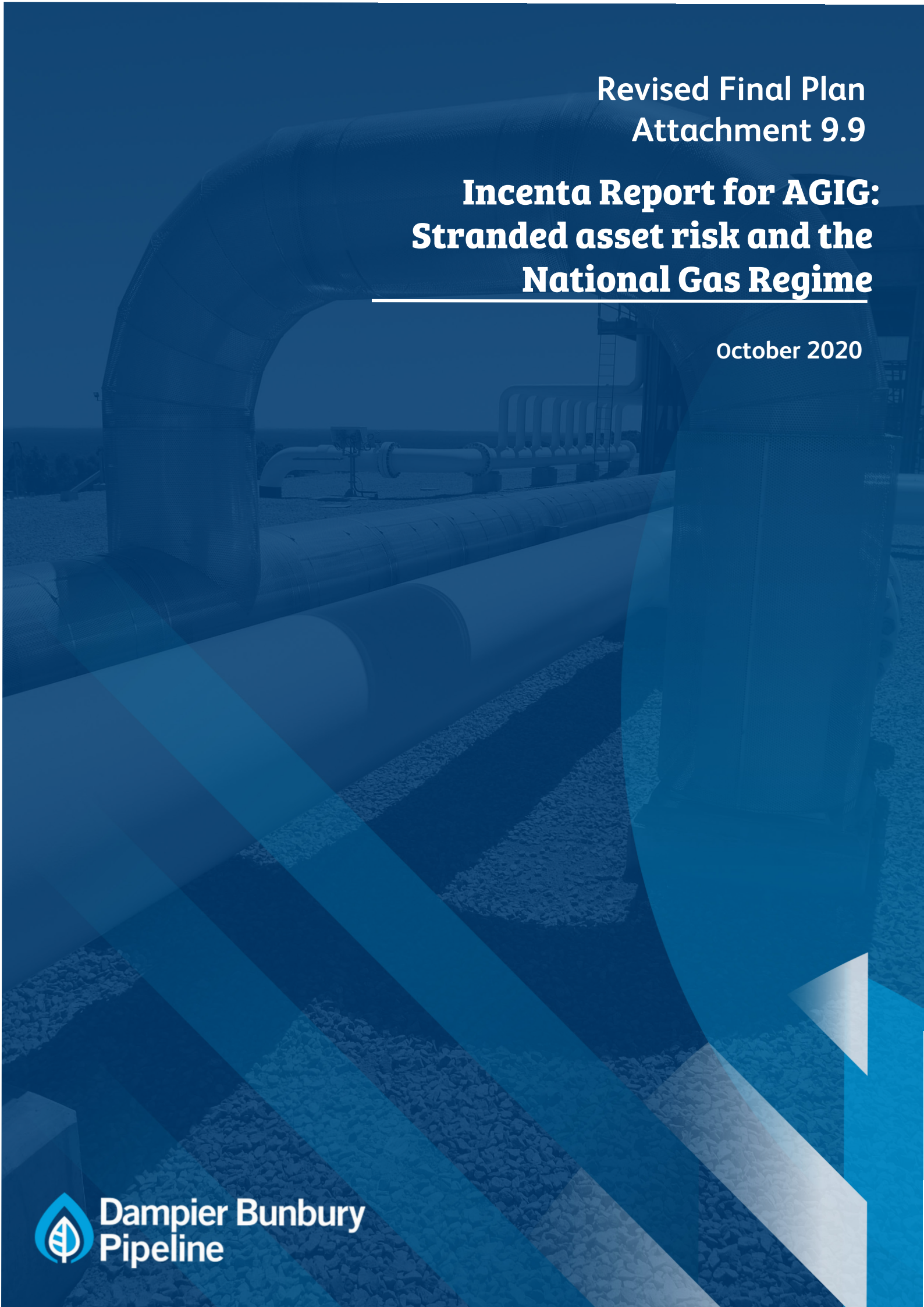
Revised Final Plan
Attachment 9.9

Incenta Report for AGIG: Stranded asset risk and the National Gas Regime

October 2020

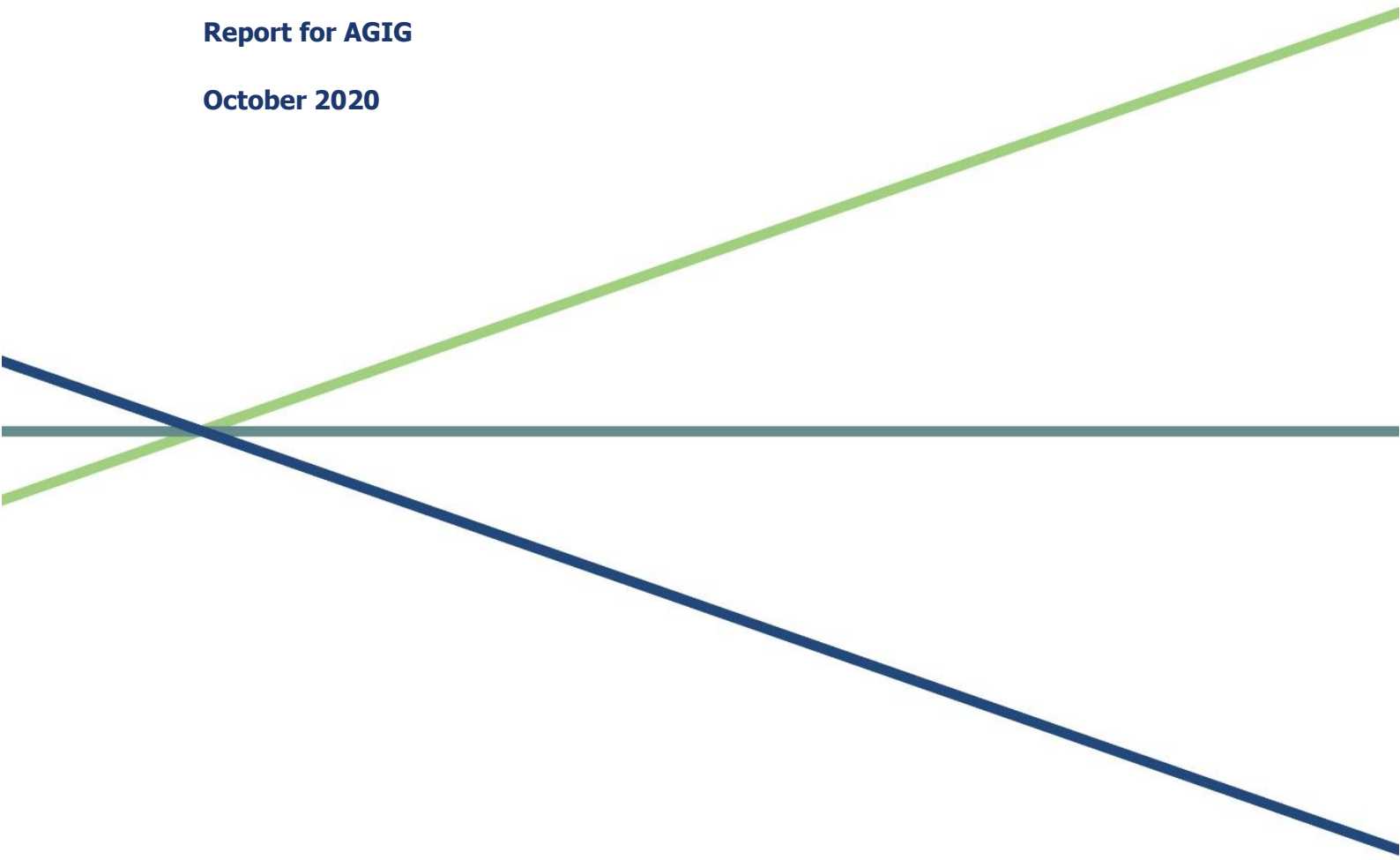


Dampier Bunbury Pipeline

Stranded asset risk and the National Gas Regime

Report for AGIG

October 2020



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1. Introduction and overview

1.1 Our brief

1. AGIG has submitted access arrangement revisions in relation to the Dampier to Bunbury Natural Gas Pipeline (DBNGP) to cover the period 2021 to 2025. One of AGIG's proposals is to reduce the remaining life for the principal pipeline assets for regulatory depreciation calculations in order to reduce the risk that the DBNGP may be constrained by competition in the future (via alternative energy sources). The potential outcome is that this competition may leave the DBNGP being unable to set reference tariffs sufficient to recover the capital base projected to exist at that time. AGIG's proposal was supported by an analysis of the likely cost of substitute energy sources in the future together with the implications of those alternatives for the transportation charge that would be sustainable for the DBNGP. The ERA's draft decision was to deny the revision to the remaining life for the pipeline assets on the basis that the proposed life would no longer match the economic life for the asset, and so be inconsistent with Rule 89(1)(b).

2. We ("Incenta Economic Consulting", "Incenta", "us") have been asked to comment on how the potential for the assets to become stranded in this manner should be analysed under the National Gas Rules and the National Gas Law.

1.2 Summary of opinion

3. We use the term "stranded" to refer to the situation where a regulated business is unable to set and sustain prices that will allow it to recover its remaining investment costs (i.e., its capital base), for example because of technological change that exposes it to meaningful competition or a government policy measure.[1]

4. We observe that the choice of depreciation schedule for an asset or group of assets is a function of a series of decisions, which are:

   a. the remaining life for the asset, and

   b. the profile over which the asset is to be depreciated, which in turn is a function of:

      i. the specific method of depreciation that is selected which, depending on the method, may require further inputs,[2] and

      ii. whether or not the asset is to be indexed for inflation (i.e., whether depreciation is defined as the return of investment in historical cost terms or inflation-adjusted terms).

[1] The National Gas Rules contain the concept of "redundant capital", which is a mechanism by which a regulator could deny the recovery of costs in certain circumstances (and subject to a number of requirements), and is a separate matter.

[2] For example, a tilted annuity depreciation method – which has been used in certain contexts in the telecommunications sector – also requires a tilt (growth) factor, and is sensitive also to the cost of capital.

5. The principal guidance in the National Gas Rules for the profile of depreciation is Rule 89(a), which requires that the depreciation schedule be designed "so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services". This principle, in turn, can be interpreted as directing consideration of both the demand and supply of reference services, namely that:

   a. *Demand side* – the time path of reference tariffs that are implied by the depreciation profile be most consistent with encouraging the efficient use of the asset, and

   b. *Supply side* – the profile of depreciation be consistent, so far as it is relevant, with providing the capacity for the investment and operating activities required to ensure that the efficient growth in the market is served, a critical feature of which is an expectation that efficient costs will be able to be recovered.

6. In terms of the supply-side condition, we prefaced this with "so far as it is relevant", because in circumstances where a regulated business is protected from competition and any other threats to cost recovery, then it is well established that the choice of depreciation method will not affect whether costs will be recovered, but merely the timing of that recovery.[3] Indeed, this has been the implicit assumption where the requirements of Rule 89(1)(a) have been considered to date. However, where there is a prospect that the service provider may have its revenue constrained by a competitor or some other factor below the level that will be required to recover costs, then the profile of depreciation may have a material impact on whether that emerging risk is likely to result in assets becoming stranded, and so the supply side dimension becomes relevant.[4]

   a. In particular, if there is a material prospect that the market may evolve in the future such that, under some profiles of depreciation, competition may preclude the (future) unrecovered costs to be recovered, this rule would require the profile of depreciation to be altered as necessary to create the reasonable expectation that costs will be able to be recovered.[5]

   b. If depreciation was not altered in this manner then it cannot be said that reference tariffs would be varying "over time in a way that promotes efficient growth in the market for reference services".

7. In addition, the first of the "revenue and pricing principles" provides additional force to the interpretation above, counselling that a regulator's decisions should be consistent with providing a reasonable expectation of recovering efficient cost. Further, we note

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3 This outcome is demonstrated in: Schmalensee, R (1989), 'An Expository Note on Depreciation and Profitability Under Rate-of-Return Regulation', *Journal of Regulatory Economics*, Vol 1, pp.293-298.

4 The impact of future competition on the permissible regulatory depreciation profiles was analysed in: Crew, M and Kleindorfer, P (1992), Economic Depreciation and the Regulated Firm under Competition and Technological Change', *Journal of Regulatory Economics*, Vol 4, pp.51-61. For additional discussion of the economic principles underpinning regulatory depreciation choices, see: Allen Consulting Group (2003), Principles for Determining Regulatory Depreciation Allowances, Report for IPART, September (the report to IPART was co-authored by an author of the current report).

5 Appendix A provides a case study from NZ on its approach to stranded asset risk and the role for depreciation. This case study provides an example of the practical application of the appropriate principles for the treatment of stranded asset risk.

that creating an environment that encourages efficient investment in, and operation of, gas pipelines – which is the objective of the adjustment to depreciation contemplated above – is quite clearly an outcome that will advance the long term interests of end-users, and so advance the NGO.

8. We observe that, while AGIG's proposal was framed as a change to the remaining life of the principal pipeline assets, the core of its proposition was that:

   a. under the existing profile of depreciation there was a material risk of future asset stranding, and so

   b. it was possible to alter the profile of depreciation to reduce that risk, and that such an adjustment should be made.

9. There are a range of options for adjusting the depreciation schedule that would be able to remove the risk of asset stranding as prompted by Rule 89(1)(a) whilst simultaneously meeting the requirements of Rule 89(1)(b). One option that we would recommend be given consideration is the application of a "kinked" depreciation method, whereby an acceleration would be applied to a defined period in order to reduce the capital base to a level that is recoverable at the time that stranding otherwise would occur, but where it is clear that depreciation is being applied over the full anticipated service life of the pipeline.

   a. Having said that, we note that the application of a kinked depreciation schedule would be very similar in effect to what AGIG originally proposed, albeit structured in a way as to address the ERA's concern about the requirements of Rule 89(1)(b).

2. Elaboration

2.1 Stranded asset risk

10. Regulatory depreciation has typically been applied on the presumption that the activity will continue as an enduring monopoly, and with demand continuing to increase (or at least not contract) into the future. In this world there is little concern about costs being returned to investors over very long time frames. A stranded asset risk emerges for gas networks where there is a prospect that pipeline owners will not be able to recover all of the amounts that have been invested. Importantly, the presence of a material stranded asset risk does not mean there is no uncertainty about the extent of the risk, or that the risk is fully understood. Instead, the risk must simply be real, this is the nature of something being a "risk".

11. Examples of particular threats to cost recovery that might emerge for gas pipelines include:

    a. Alternative technologies, such as increasing electrification and stand-alone supply, as a competitor to gas

    b. Reducing consumption caused by gas appliance efficiency improvements and customers switching energy sources, and

    c. Environmental policies that threaten whether natural gas will remain a permitted fuel for use, for instance, under zero carbon policies.

12. Stranded asset risk impacts on the firm's expectation about their future returns and, all else constant, will reduce the expected return below the regulatory weighted average cost of capital.[6] As the expectation of a normal return on investment is a necessary pre-condition for new investment to proceed. Accordingly, where a stranded asset risk becomes sufficiently material a change is required in order to preserve the expectation that a firm will be able to earn a normal return on investment.

2.2 Policy objective for regulatory depreciation

13. There are a number of outcomes for regulatory depreciation that can be implied by the principles of good regulatory economics, and that have been accepted as desirable or applied in Australian regulatory matters. These include that:

    a. There should be a high degree of confidence that costs (i.e. the RAB) will be recovered over the economic life of the assets such that financial capital maintenance is achieved. Where a future constraint to cost recovery is expected, this confidence is provided by recovering a greater proportion of cost while the capacity to recover is

[6] The propositions that (i) stranded asset risk reduces the expected return, and (ii) a standard estimate of the weighted average cost of capital (including the cost of capital as estimated by the ERA) does not include compensation for this downside risk are well accepted, and so is not dwelt upon in detail here. Appendix A includes quite a clear discussion from the New Zealand Commerce Commission on this matter, although similar clarity can be found in discussions by many of the economic regulators.

higher (and so the amount left to recover in the future is consistent with the expected future capacity to recover). This confidence is required so that efficient investment will not be discouraged. It is also important in this context to ensure that costs are only recovered once so that customers do not pay more than is required.

b. Subject to this first objective being achieved, the recovery of costs should be spread over time in a manner that encourages the efficient use of assets. If this outcome is not met then the use of the asset will not be optimised over its economic life. This outcome is encouraged by setting depreciation with reference to the capacity to recover costs.

c. The timing of cash flow to the regulated business over time facilitates the prudent and efficient financing of the asset in question, and thereby the maintenance of an investment grade credit rating.

14. In this instance, it is particularly illustrative to draw on one of the earliest applications of incentive regulation in Australia as a guide to the regulatory approach for depreciation. In this case, the Office of the Regulator-General (ORG) consulted on its approach to regulatory depreciation as part of its first review of prices for electricity distribution networks. In doing so, it highlighted the primacy of a cost recovery objective:[7]

The regulatory asset base represents the regulator's view of the market value of the regulated business at any point in time. Accordingly, the regulator can be interpreted as making an implicit commitment to ensure that the market value of those assets does not fall below the regulatory asset base over time. The objectives of encouraging efficient investment will only be met if this remains a credible commitment.

This has important implications for the design of the regulatory depreciation profile. In particular, in order to ensure that the regulatory asset base remains at or below the market value of the assets, the regulatory regime must permit each distribution licensee to have their capital returned at a rate that keeps pace with the decline in the economic value of their assets. This in turn implies that regulatory depreciation must at least keep pace with economic depreciation. This will ensure that the value of the distribution licensee should not be placed in a position in the future where it is not able to set tariffs that are expected to recover the benchmark revenue requirement.

15. Achieving the outcomes above may require the depreciation profile to depart from the standard straight-line approach on a CPI-indexed asset base – that is, depending on the context, depreciation may need to be advanced or deferred. For instance:

a. Where demand is expected to become more price sensitive in the future, or there is a threat to future cost recovery due to customers switching to alternative technologies, it would be more efficient to recover more of the residual cost before these scenarios make it no longer possible to expect full cost recovery.

[7] ORG, '2001 Electricity Distribution Price Review, Cost of Capital Financing, Consultation Paper No. 4', May 1999, p. 15.

b. Alternatively, where significant new augmentation is undertaken this may cause prices to rise to a level that might discourage efficient use of the network, suggesting that delaying the recovery of some costs might be prudent in order to smooth prices over time, or to recover costs when demand increases, subject to the deferral of cost recovery no creating barriers to the financeability of the projects.

2.3 National gas regime

2.3.1 National Gas Rules

16. The rules for gas pipelines related to depreciation are drafted in a way that provides flexibility to the service provider to propose, and the regulator to accept, a change to depreciation where necessary to ensure cost recovery and to generate efficient prices.

17. The Rules that are most relevant to this matter are Rules 89(1)(a), (b) and (c), namely that

> *… the depreciation schedule should be designed:*
>
> *(a) so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services; and*
>
> *(b) so that each asset or group of assets is depreciated over the economic life of that asset or group of assets; and*
>
> *(c) so as to allow, as far as reasonably practicable, for adjustment reflecting changes in the expected economic life of a particular asset, or a particular group of assets; and*

18. The second and third of these principles work in tandem. The second requires assets to be depreciated over their economic lives, and the third then envisages that the remaining lives of assets would be adjusted over time so that they continue to track their economic lives as new information becomes available.

19. In terms of the first principle, it is our view that this should be interpreted as requiring attention to both the demand and supply sides of the equation, namely that:

a. *Demand side* – the time path of reference tariffs that are implied by the depreciation profile be most consistent with encouraging the efficient use of the asset, and

b. *Supply side* – the profile of depreciation be consistent, so far as it is relevant, with providing the capacity for the investment and operating activities required to ensure that the efficient growth in the market is served, a critical feature of which is an expectation that efficient costs will be able to be recovered.

20. In terms of the supply-side condition, we prefaced this with "so far as it is relevant", because in circumstances where a regulated business is protected from competition and any other threats to cost recovery, then it is well established that the choice of depreciation method will not affect whether costs will be recovered, but merely the

timing of that recovery.[8] Indeed, this has been the implicit assumption where the requirements of Rule 89(1)(a) have been considered to date.

21. However, where there is a prospect that the service provider may have its prices or revenues constrained by a competitor or some other factor below the level that will be required to recover costs, then the supply side dimension become an important factor. In particular, to the extent that the market may evolve in the future such that, under some profiles of depreciation competition may preclude the (future) unrecovered costs to be recovered, then this rule would require the profile of depreciation to be altered as necessary to create the reasonable expectation that costs will be able to be recovered. In doing so, efficient investment, and so efficient growth, in the service will be promoted.[9]

2.3.2 Revenue and pricing principles

22. The Revenue and Pricing Principles (RPP) are set out for gas networks in section 24 of the National Gas Law. The intention of the RPP is to provide additional guidance to the AER (and AEMC) when considering matters relating to economic regulation and pricing.

23. The RPP are highly relevant to the approach taken to depreciation and the management future cost recovery risks. This is because they provide a direct instruction that regulated businesses be provided with a reasonable opportunity for cost recovery. In addition, they seek to ensure an expectation of earning of at least a normal return, and that the regulator has regard to the costs and risks associated with under-investment. If costs are not returned to investors sufficiently quickly, these are principles that cannot be met. Specifically, key provisions and their relevance are:

    a. A regulated network service provider should be provided *"with a reasonable opportunity to recover at least the efficient costs"* the operator incurs.[10] Therefore, it is appropriate that action be taken to provide a reasonable assurance that costs are returned to investors sufficiently fast that this principle can be met.

    b. A price or charge for the provision of services should allow *"for a return commensurate with the regulatory and commercial risks involved".*[11] If the regulatory approach does not permit that capital invested is returned to investors, it is clearly not possible the provider to earn a return commensurate with the regulatory and commercial risks involved. The proposal from AGIG is aimed at allowing it to recover efficient costs and so earn a normal return on investment.

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8 This outcome is demonstrated in: Schmalensee, R (1989), 'An Expository Note on Depreciation and Profitability Under Rate-of-Return Regulation', *Journal of Regulatory Economics*, Vol 1, pp.293-298.

9 The impact of future competition on the permissible regulatory depreciation profiles was analysed in: Crew, M and Kleindorfer, P (1992), Economic Depreciation and the Regulated Firm under Competition and Technological Change', *Journal of Regulatory Economics*, Vol 4, pp.51-61. For additional discussion of the economic principles underpinning regulatory depreciation choices, see: Allen Consulting Group (2003), Principles for Determining Regulatory Depreciation Allowances, Report for IPART, September (the report to IPART was co-authored by an author of the current report).

10 Section 24(2) of the NGL.

11 Section 24(5) of the NGL.

c. *"Regard should be had to the economic costs and risks of the potential for under and over investment"* by a regulated network service provider.[12] Returning capital invested to AGIG earlier than otherwise does not mean that it earns a higher return; it is NPV neutral. Therefore, there is little reason to be concerned that returning capital earlier than otherwise would lead to over-investment by a service provider. Further, there is little reason to believe NSPs would have the incentive or capability to over-invest in the network purely due to capital being returned sooner than otherwise. Conversely, however, where businesses perceive there is a material risk of cost being unrecoverable, this is likely to have detrimental impact on the incentives for investment, and so a consequent risk of under-investment.

2.3.3 National Gas Objective

24. The objective of the National Gas Law is:

to promote efficient investment in, and efficient operation and use of, natural gas services for the longer term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas

25. Three separate components of the objective can be usefully distinguished, namely:

a. The requirement to promote economic efficiency with respect to investment, operation and use

b. The reference to the long-term interest of consumers, and

c. The requirement that the above instruction be focused on the price, quality, safety, reliability and security of supply of natural gas.

26. A common interpretation of the first two components are they essentially lead to the same outcome, namely that the long-term interests of consumers will be promoted by targeting economic efficiency. Therefore, it is apparent that a key focus of the NGO is to promote efficiency, and with particular attention drawn to efficient investment. As has been identified above, the capacity and incentive to invest is influenced by the extent that a service provider can expect to recover at least the efficient costs of supply and so earn a normal return on investment. Consequently, in circumstances where there is a future threat to cost recovery, the profile of depreciation should be one that supports the recovery of cost, and so the motivation for continued investment, and so growth in the service, when it is efficient.

2.4 The circumstances in relation to the DBNGP

27. As discussed earlier, the concern that has prompted AGIG's proposal to adjust depreciation for its principal assets is that technological change has a real potential to create meaningful competition from alternative energy sources, which may in turn constrain the prices that the DBNGP is able to charge in the future. More specifically, AGIG's concern is that this technological change may constrain it to charge lower prices

[12] Section 24(6) of the NGL.

than those that would be permitted under an application of the National Gas Rules, in turn meaning that the DBNGP would not be able to recover its costs. In addition, AGIG has argued that if the rate of depreciation is increased sufficiently from now, then there will be a realistic potential for the DBNGP to recover its efficient costs.

28. For the reasons discussed earlier, assuming the facts underpinning AGIG's argument were accepted, the appropriate response would be to alter the profile of depreciation in order to restore the situation whereby DBNGP has a reasonable expectation of recovering its efficient costs.

29. We observe that AGIG's proposal was not framed in terms of altering the profile of depreciation, but rather as altering the remaining lives by an amount that was sufficient to address the stranding risk. The ERA's concern was that, by adjusting lives in this manner, the depreciation schedule would be applying lives shorter than the DBNGP expected to remain in operation, which is said was inconsistent with the requirement to depreciate the assets over their economic lives.

30. Irrespective of how economic life is to be interpreted, it is possible to alter the profile of depreciation in such a way that addresses the type of stranding risk identified, whilst also using the lives in the calculation that reflect the expected service life of the pipeline, and indeed there are a range of options through which this may be achieved. As a simple example, assume that:

    a. the asset has a current capital base of $1 billion and a remaining life of 60 years, but

    b. the capital base that is considered to be recoverable (due to competition) after 20 years is half of this ($500 million).

31. The above assumptions imply that material stranded asset risk is expected – the recoverable capital base after 20 years is $500 million, whereas the capital base will be $667 million, implying an unrecoverable cost of $167 million. In this case, the simplest of depreciation functions would be to apply a "kinked" depreciation schedule, which has the form:

$$Depreciation_t = \frac{1}{Adjusted\ total\ life_t - Actual\ life_t} Opening\ capital\ base_t, for\ t = 1\ to\ T$$

$$Depreciation_t = \frac{1}{Total\ life_t - Actual\ life_t} Opening\ capital\ base_t, for\ t = T+1\ to\ L$$

Where:

T is the number of years remaining before the constraint to the capital base is expected

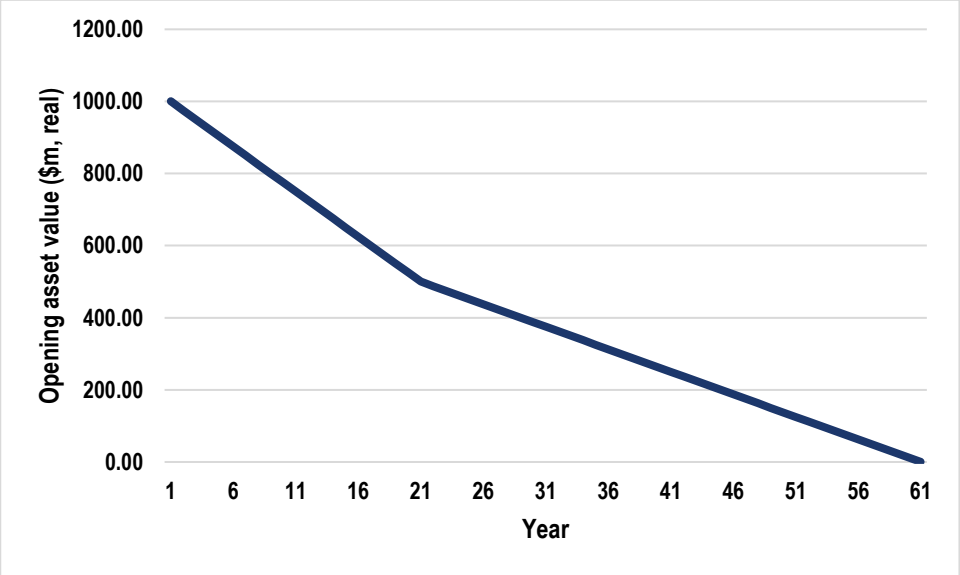
Adjusted total life = Total life / Acceleration factor, where:

$$Acceleration\ factor = \frac{L}{T}(1 - Capital\ Base\%), \text{ and}$$

Capital Base% is the proportion of the capital base that will be recoverable after year *T*.

32. Applying the formula above implies an acceleration factor for the first 20 years of 1.5, and a time path for the capital base as shown in Figure 1 below.

Figure 1 – Time path for the capital base under a kinked depreciation profile



33. In our view, such a depreciation profile would meet the requirements of Rule 89(1)(a) for the supply side as well as Rule 89(1)(b) (economic life), and most likely result in a time path for reference tariffs that encourages efficient use (and so meet the requirements of Rule 89(1)(a) for the demand side).

34. We note for completeness that the application of a kinked depreciation schedule would be very similar in effect to what AGIG originally proposed.

    a. That is, whilst AGIG's proposal was for a particular life to be applied for depreciation, its objective was to ensure that the capital base remaining when alternative energy sources created a binding constraint upon DBNGP's transportation charges would be recoverable within those constraints.

    b. Further, it was also envisaged that the return of capital after these constraints started to bind would slow down materially – as the return of capital now would be driven by the price of alternative energy sources – thus creating a kink in the explicit and implicit depreciation schedule.

    c. Thus, the formula set out above is a means though which AGIG's original proposal can be structured, whilst also avoiding the ERA's concern that using a life in the depreciation calculation that differed to the expected service life may be non-compliant with Rule 89(1)(b).

35. In addition to the example above, there are a range of other depreciation methods that could be applied to target a particular capital base value at a certain point in the future and could be valid alternatives, including:

    a. a geometric depreciation function, where the multiplicative factor is would derived to generate the capital base that is recoverable at the target date, and

    b. a tilted annuity depreciation function, where the tilt factor for the annuity would be selected to deliver the capital base that is recoverable at the target date.

36. Any of these methods could be calibrated to simultaneously restore a reasonable expectation of the recovery of efficient cost, whilst applying depreciation over the expected service life of the pipeline.

A. Case Study – discretionary shortening of asset lives for New Zealand electricity distribution[13]

A.1 Introduction and summary

37. This Appendix sets out how the New Zealand Commerce Commission has approached the issue of economic asset stranding in the context of electricity distribution. Like in AGIG's original proposal, the Commission proposed to respond to the risk of economic asset stranding by adjusting the lives of assets. However, as with AGIG's original proposal, the Commission's objective was to reduce regulatory asset values sufficiently so that there was greater confidence that the remainder would be recoverable after the stranding event. Implicit in its proposal was an assumption that depreciation could be readjusted again (e.g., after the target regulatory asset value had been achieved) to spread the recovery of the remaining regulatory asset value over the service lives of assets.[14]

38. More specifically, the New Zealand Commerce Commission introduced the option for regulated electricity distributors to apply for a shortening of asset lives when it reviewed the Input Methodologies for the sector in 2016.[15]

39. The following lessons can be drawn from this case study.

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13 In New Zealand, all electricity and gas networks are subject to information disclosure (ID) regulation, which in practice is a requirement to produce regulatory accounts, and all except the small electricity distributors owned by consumer-trusts (12 of 29 electricity distributors) are subject to ex ante price control. The standard form of price control for all gas networks and electricity distribution is known as the "default price path" (DPP), in which, whilst the building block approach is applied to derive required revenues, low-cost methods are used to forecast expenditure and an attempt is made to reduce complexity where possible. Regulated businesses then have the option to apply for a "customised price path" (CPP), which enables more focus on firm-specific needs where this is justified. In practice, the methods applied for the "default price path" have evolved to be sufficiently robust that only three firms (all electricity) have ever applied for a "customised price path", and one of which was the electricity distributor whose assets were substantially damaged by the Christchurch earthquakes. Electricity transmission (which is undertaken by a single entity) is only subject to a method that is equivalent to the customised method (but referred to as an "individual price path" (IPP) given there is no default option) given the very lumpy nature of its expenditure profile.

14 As a practical matter, if the competitive constraint does emerge, then it may become necessary to adjust depreciation so that the remaining cost recovery is spread over the remaining lives of the assets to ensure that prices remain under that competitive constraint.

15 The regulatory process in regulation in New Zealand is divided into two phases, namely (i) the determining of the methods through which regulation is to occur, which is set out in the Input Methodologies, and (ii) the application of the methodologies, for example, to set ex ante price controls. The New Zealand Commerce Commission's discretion over how it regulates is broad, and so part of the function of the Input Methodologies is to set out the details of the approach, much like the "rules" in Australia. In addition, however, the Commission has used the Input Methodologies to focus debate about controversial matters, such as the WACC – and then prescribes the outcome – and so the Methodologies also function like the binding guidelines that we have in Australia. The Commission is required to review the Input Methodologies no less frequently than every 7 years, although it can review them earlier, and the Methodologies in effect at a given point in time are binding upon the Commission when performing its regulatory functions.

a. The NZ Commerce Commission has endorsed financial capital maintenance as an explicit goal for regulation, and that the presence of material stranded asset risk (absent compensation) would be detrimental to this goal.

b. The Commission has endorsed an adjustment to regulatory depreciation as an appropriate tool to reduce stranded asset risk, and has noted that because this tool is NPV neutral, it is justifiable to move whilst there is still material uncertainty about the risk. Moving early will also reduce the effect on customers of future adjustments that may be needed to ensure financial capital maintenance.

c. The Commission disallowed the shortening of lives in the one application that has been made under that framework; however, the dismissal in that case was quite justified as it appeared to have quite material shortcomings in its empirical justification.

   i. In discussing this matter, the Commission observed that the empirical work it expected would be a modelling of customers' decisions under plausible scenarios about technological change, with a tracing through of the joint implications for demand, the cost-based price and, ultimately, whether cost recovery would be possible.

   ii. The Commission also observed that it did not intend to set a particularly high hurdle for such an application to be granted.

d. The ability to have asset lives shortened was not extended to gas; however, this is largely explained by the unique circumstances of the NZ gas sector, including that the sector is still experiencing material growth (reflecting its current low penetration) and the fact that asset lives in the sector are already very short by Australian standards.

A.2 Problem – economic stranding caused by technological change

40. The problem that the Commerce Commission intended to address was the potential for a regulated business not to expect to recover its costs over the current regulatory lives of its assets, which the Commission referred to as "economic stranding". The Commission explained this concept – and distinguished from the case where assets merely become unused (but where costs would still be recovered under the Commission's approach) as follows:[16]

> *72. The IMs allow for assets to stay in the RAB even though they have ceased to be used (ie, become physically stranded). Therefore, physical asset stranding is not the risk under consideration. Rather, it is the risk that the network becomes economically stranded. That is, the risk is that at some future point enough consumers elect to disconnect from EDBs' networks such that the revenue EDBs are able to recover from the remaining customer base is insufficient to allow them to fully recover their historic capital investment (hence the title 'risk of partial capital recovery'). This is because prices to those remaining consumers would need to rise beyond their*

[16] Commerce Commission, 2016, Input Methodologies – final decision reasons paper, topic paper 4, paras.72-73.

willingness to pay given their economic alternatives (or beyond politically acceptable levels).

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

41. The potential driver for economic stranding was the technological change, and the potential for that change to introduce substitutes for – and so reduce the demand for – regulated electricity networks. However, relevantly, the Commission did not conclude that the risk of economic stranding was imminent or material in the short term, rather that the situation had become more uncertain since the last review of the Input Methodologies, and specifically that there were factors that could reduce demand for networks (such as the increased economics of stand-alone supply) as well as factors that could raise demand for networks (such as increased penetration of electric vehicles), and both of which may be related to further improvements in battery technology:[17]

80. We consider that the available evidence is inconclusive on whether the risk of partial capital recovery for EDBs' regulated business has increased and, if so, by how much. We consider that partial capital recovery is unlikely to be a significant concern in the short term, but may be an issue over the longer term. We presented the main elements of the analysis that supports this conclusion in Attachment A of the draft topic paper.

81. What also seems clear to us is that the magnitude and direction of the risk (when considering both the potential downsides to the regulated business and potential upsides from EDB involvement in unregulated services) has become more uncertain compared to 2010.

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

A.3 Solution – ability to apply for an advancement of depreciation

42. The Commission's solution was to permit EDBs to apply for a shortening of asset lives for regulatory purposes during a price reset, with a maximum reduction of the weighted average remaining life set at 15 per cent. Being a proposal, the decision of whether the life reduction would be permitted would remain with the Commission.

[17] Commerce Commission, 2016, Input Methodologies – final decision reasons paper, topic paper 4, paras.80-82. The Commission earlier had discussed the views of stakeholders, which showed that even within the industry there were those (most notably Vector) that considered the risk to networks from technological change to be material and imminent (see paras.29.2 and 32.2), whilst others (and the industry umbrella group) considered the issue less significant (see paras.30/1, 30.3, 33.1, 33.2).

43. The Commission noted that permitting early action would lessen the size of the reaction required if the stranding risks eventuated:[18]

> *88. Our chosen solution mitigates the risk of potential future price shocks for consumers, which would likely be required to maintain the expectation of ex-ante FCM if (and when) the downside risk scenario becomes more likely. In that sense, this is a precautionary measure consistent with the nature of the problem – one of increased uncertainty. By allowing EDBs the option of a more rapid time profile of capital recovery, should the risk of widespread disconnections eventuate, the amount of remaining capital to recover at that time will be less than would otherwise be the case. Not permitting asset life adjustments now would risk increasing the materiality of any potential future adjustment to asset lives, if the risk becomes more likely. The resulting price shock would be larger, and we therefore consider that acting now is a prudent way for the IMs to reflect the changed environment.*

44. The Commission also emphasised that, because adjusting depreciation is NPV neutral, it was appropriate to "move early" even whilst uncertainty surrounded the existence of the risk. for example, when responding to a submission that noted that "there is inconclusive evidence that the risk of partial capital recovery has increased as a result of emerging technology [and so] the Commission's proposal for accelerated depreciation, therefore, lacks compelling reasoning, and is not reflective of the risks EDBs face", the Commission noted that:[19]

We agree that it is unclear whether the risk has increased. That is why our solution is an NPV neutral measure that mitigates the impact to consumers should the risk eventuate, rather than compensating suppliers for bearing the risk.

A.4 Application of the new rules – 2020 price reset

45. Under the process above, an electricity distributor was required to apply for the reduction to the regulatory lives applicable to assets, and to demonstrate that the relevant principles were met. There has been one review since that time – the 2020 price reset – and only one of the 17 electricity distributors applied for a life adjustment (Vector). Ultimately, the Commission did not accept the proposal.

46. The Commerce Commission effectively endorsed the type of modelling that Vector said had prompted its concern that the risk of economic stranding was real and so an adjustment to regulatory depreciation would be justified, as follows:

> *D51 Vector's customer technology scenario modelling is essential to providing evidence for its assertion that its adjustment factor should be applied. The modelling evidence needs to be reasonably persuasive that network stranding is a sufficiently established risk.*

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18 Commerce Commission, 2016, Input Methodologies – final decision reasons paper, topic paper 4, para.88.

19 Commerce Commission, 2016, Input Methodologies – final decision reasons paper, topic paper 4, footnote 86.

47. The "customer technology scenario modelling" to which the Commission referred was described in Vector's application for the life adjustment as involving:[20]

    a. the adoption of a range of scenarios representing the future range of plausible scenarios with respect to technological change and customer behaviour, drawing upon inputs from a range of credible sources

    b. translating the scenarios into a resulting range of load and usage forecasts

    c. applying expenditure forecasts consistent with its long-term planning and to be consistent with the load assumptions for the relevant scenarios, and

    d. converting the above assumptions into a future cost of service and price for the use of the network.

48. The key conclusions that Vector drew from its modelling were summarised by the Commission as follows:

> *D52 Paragraphs 83, 99 and 101 of Vector's notice provide some of the key outputs of the scenario analysis. They are that:*
>
> > *The modelling shows multiple scenarios where partial capital recovery is likely.*
> >
> > *The review found that three scenarios produced significant year-on-year price increases for customers. The price rebalancing by accelerating depreciation would provide some reprieve to the sustained price increases expected by customers in some scenarios.*
> >
> > *Importantly, the review found the magnitude of the expected sustained price will not be adequately rebalanced by the depreciation adjustment factor capped at a maximum of 15 percent.*

49. However, the Commission declined to accept Vector's application, and from the Commission's discussion it would appear that it believed that Vector had not in fact generated all of the modelling outcomes that Vector had summarised in its application, and did not hand over any of its modelling to the Commission.[21] It is notable that neither Vector's application nor anything in its subsequent submissions had:

    a. explained how it had determined which scenarios resulted in asset stranding – it is assumed that this would have required assumptions about the customers' alternative non-electricity-grid choices, but this was not explained and elaborated upon, and/or

    b. even presented information on the price trends under the different scenarios

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20 Vector (2019), Application for a life adjustment, pp.23-26.

21 The Commission's concerns were addressed in its draft decision; however, rather than address those concerns directly (i.e., including to support its claims with modelling), Vector instead reframed its application as being about maintaining financeability rather than only or even necessarily about stranding (Vector, 2019, Response to the Draft Decision, pp.18-20).

i. moreover, the Commission noted that Vector said it calculated price trends in $/kWh terms, which assumes implicitly that there is no pricing reform (i.e., to shift more cost recovery to fixed charges), which in turn is not a particularly defensible assumption.

50. Thus, the Commission noted that, whilst it did not intend to set a high standard for evidence, some nonetheless was required, and so it was fatal that Vector failed to release modelling results to back up its assertions:[22]

D22 *Overall, we consider that despite a relatively low level of evidence being required given the low-cost nature of the DPP, Vector did not include sufficiently convincing evidence in its application.*

D23 *In its application, Vector's key reasoning for the appropriateness of an adjustment factor was its view of a material risk of partial economic recovery. However, the application did not include the basis of the scenarios which it modelled. Given that it is the outputs of this scenario modelling that was provided as evidence of the risk, the application should have laid out the basis of the different scenarios to show whether they are at all likely and whether actions by the distributor could avoid these scenarios (such as through pricing reform). It also should have included the numeric outputs of the modelling.*

51. To a large extent, the disallowance of Vector's application (and, implicit in the material presented, Vector's inability to make a defensible case that stranding risk had become material) reflected the emerging industry consensus that some of the uncertainty when the IMs were determined had been resolved, and notably that electricity networks were likely to remain essential to the vast majority of customers:[23]

D54 *When we commenced work on our IM review that was completed in 2016, there was much discussion of the risk for distribution networks of many disconnections as consumers go off-grid. This reduction in use of the assets could result in a price for use that becomes greater than consumers' willingness to pay, exacerbating the exodus or requiring a reduction in price below that which results in a normal return. It was in that context that we consulted on and implemented the adjustment factor provision in the IMs.*

D55 *The industry emerging view would now seem to be that distribution networks will continue to be essential for most consumers, and that the prospect of high market share for electric vehicles reinforces this. However, the nature of the use of electricity distribution services may change for some consumers, increasing the importance of tariff reform towards cost-reflective and service-based pricing.*

52. In view of the Commission's view that electricity networks were going to remain essential, it also considered that price reform would be a preferred route for resolving potential equity issues between customers (i.e., to remedy the concern that customers that

[22] Commerce Commission (2019), EDB DPP reset – final, reasons paper, paras.D.22-D.23. Later in its discussion, the Commission criticised Vector for releasing any modelling results to support the outcomes that it was asserting (paras D.53, D.56).

[23] Commerce Commission (2019), EDB DPP reset – final, reasons paper, paras.D.54-D.55.

consume little energy may pay little, but still cause the same cost as other customers),[24] and it was not persuaded by Vector's argument that its financeability concerns provide a valid basis for shortening asset lives (which we also note was never part of the reasoning for the life-adjustment).

A.5 Statements in relation to gas businesses

53. The potential for an asset life adjustment was considered for the NZ gas businesses, but not extended to them. The Commission set out some of the reasons as to why asset stranding risk may be an issue for gas businesses;[25] however, it was also noted that as the gas sector in New Zealand is still growing at a reasonable rate (reflecting its low penetration), raising prices now may be the contrary response.[26]

54. Ultimately, whilst the Commission signalled that it was open to permitting an application for a life reduction for the gas sector, the industry did not push the issue with any vigour. One of the factors that may explain this is that the weighed average remaining life for many of the gas pipeline assets (as well as the electricity assets) are very short by Australian standards. These remaining lives as at the start of each firm's 2021 financial year are set out in the following table:

24 Commerce Commission (2019), EDB DPP reset – final, reasons paper, para.D.97.

25 Commerce Commission, 2016, Input Methodologies – final decision reasons paper, topic paper 4, para.98. These factors included the presence of economic alternatives to gas and low penetration in New Zealand, although the effect of measures to address climate change were not mentioned.

26 This argument against the asset life adjustment was presented forcefully by an adviser for one of the major gas pipeline businesses (see Commerce Commission, 2016, Input Methodologies – final decision reasons paper, topic paper 4, para.102).

Table 1: Remaining asset lives as at the start of the 2021 financial year for NZ network businesses

Regulated business	Sector	RAB ($m, 2015 [gas] 2019 [elec])	Remaining life (FY21)
First Gas trans MDL	Gas transmission	291	31.4
First Gas trans Vct	Gas transmission	503	20.8
GasNet	Gas distribution	23	19.0
Powerco	Gas distribution	348	29.0
Vector	Gas distribution	365	32.5
First Gas distribution	Gas distribution	131	20.1
Average RL (unweighted) - gas			**25.5**
Average RL (weighted) - gas			**26.9**
Alpine Energy	Elect distribution	200	13.6
Aurora Energy	Elect distribution	394	24.2
Centralines	Elect distribution	54	24.6
EA Networks	Elect distribution	259	25.2
Eastland Network	Elect distribution	155	23.4
Electricity Invercargill	Elect distribution	84	24.9
Horizon Energy	Elect distribution	125	17.4
Nelson Electricity	Elect distribution	41	26.4
Network Tasman	Elect distribution	166	22.3
Orion NZ	Elect distribution	1,051	23.9
OtagoNet	Elect distribution	187	22.2
Powerco	Elect distribution	1,658	22.7
The Lines Company	Elect distribution	189	20.4
Top Energy	Elect distribution	251	25.5
Unison Networks	Elect distribution	586	19.3
Vector Lines	Elect distribution	2,952	25.1
Wellington Electricity	Elect distribution	612	21.2
Average RL (unweighted) - elec distribution			**22.5**
Average RL (weighted) - elec distribution			**23.3**

Notes:

(1) RAB is the actual value for FY 2015 for gas and for FY 2019 for electricity distribution.

(2) The remaining life is the projected value as per the relevant regulatory model for FY2021.

(3) Financial years are ending June for all gas except MDL (which is December), and are ending March for all electricity distribution.

55. Notably, the largest gas transmission business (the former NGC) will have depreciated its existing assets by 2045, and the other transmission business (the former Maui pipeline) will have immaterial undepreciated assets by 2050. Accordingly, the longer-term factors that may curtail cost recovery for gas transmission pipelines in Australia are much less likely to have a material effect in New Zealand.