



The case for a nominal returns framework for regulated gas networks in New Zealand



A report prepared for Vector, Powerco and Firstgas | 27 August 2021



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1 Introduction

1.1 Background

1. Vector Limited (Vector), First Gas Limited (Firstgas) and Powerco (**the gas businesses**) are currently preparing for the 2022-27 default price-quality path (**DPP**) regulatory control period (**DPP3**) for gas distribution and transmission networks in New Zealand, which are regulated under Part 4 of the Commerce Act.
2. The DPP3 review will occur against a backdrop of a material increase in the risk of future economic network stranding faced by gas pipeline businesses (**GPBs**) since the Commerce Commission's (**the Commission's**) last Input Methodologies (**IMs**) review in 2016. The Commission's Process and Issues paper on the DPP3 reset for GPBs explains that this increase in stranding risk has occurred due to:¹
 - a. Shifting Government climate change policies that may impact:
 - i. the supply of natural gas (e.g., due to the Government's 2018 decision to issue no further offshore oil and gas exploration permits); and
 - ii. the demand for natural gas (e.g., due to the New Zealand Emission Trading Scheme that has resulted in the rising of carbon prices, and the Climate Change Commission's advice, which if adopted by the Government would reduce gas use in New Zealand materially); and
 - b. Technological developments that may:
 - i. Improve the cost effectiveness of electricity for end-users, potentially accelerating the transition away from gas; and
 - ii. Determine whether existing gas networks may be repurposed to supply alternative fuels to natural gas, such hydrogen.

1.2 Our instructions

3. Against this backdrop, the gas businesses have asked Frontier Economics to provide advice on whether there is an economic case for the Commission to adopt a nominal returns framework, rather than the existing real returns framework it uses at present, when regulating gas distribution and transmission networks in New Zealand.
4. This report presents our conclusions.

1.3 Authors of this report

5. This report was prepared by Professor Stephen Gray, Andrew Harpham and Dinesh Kumareswaran.

¹ Commerce Commission, Resetting default price-quality paths for gas pipeline businesses from 1 October 2022, Process and Issues paper, 4 August 2021.



6. **Professor Stephen Gray** is the Malcolm Broomhead Chair in Finance at the University of Queensland (UQ) and Chairman of Frontier Economics. Stephen advises on issues relating to valuation, cost of capital, corporate financial strategy, and pricing issues. He has advised nearly all regulated businesses in Australia (across industries and jurisdictions) on rate of return matters. Stephen's work on empirical finance, asset-pricing and corporate finance has been published in leading academic and practitioner journals. At UQ Business School, Stephen teaches a range of award and executive education courses in financial management, asset valuation, and corporate finance. He has Honours degrees in commerce and law from The University of Queensland and a PhD in financial economics from Stanford University. He has received a number of academic awards including the Prime Minister's Award for University Teacher of the Year in the Economics and Business field in 2002.
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1.4 Key findings

9. The Commission's existing regulatory framework allows GPBs to earn a real return on capital in each DPP or customised price path (**CPP**) period, with compensation for inflation (to prevent erosion of the real allowed returns) provided through indexation of the Regulatory Asset Base (**RAB**). We refer to this approach as a 'real returns framework', as it provides investors with the expectation of a real *ex ante* return, and delivers a real *ex post* return.
10. An important consequence of the Commission's real returns framework is that it delays the recovery of the investment in the regulated assets, due to inflation indexation of the RAB over time. Under such an approach, regulatory depreciation must return not only the original investment in the regulated assets, but also any accumulated revaluation gains (i.e., actual inflation) that are added to the RAB over time.
11. In our view, the Commission's real returns framework may be appropriate when regulating businesses that face no material risk of future asset stranding (and no immediate cash flow or financeability constraints). However, a real returns framework that defers cost recovery is not



appropriate for industries facing the risk of significant decline in demand and/or supply that could result in significant stranding of regulated assets.

12. Another way to think about the real returns framework is that:
 - a. Part of the required return on the capital currently invested in the business is paid by current consumers via the current (real) regulatory allowance; and
 - b. Part is paid by future consumers via indexation of the RAB.

The share paid by each group depends on expected inflation. Because the assets are implicitly expected to increase in value at the rate of inflation, the share paid by future consumers reflects the assumed increase in the value of the assets they will inherit.

13. This approach is sustainable if the value of the assets *does* increase at the rate of inflation and if there *are* sufficient future consumers to pay their component.
14. But the real returns framework breaks down when both of those requirements are uncertain.
15. If the number of consumers using the services delivered by the regulated assets is stable or growing over time, then the real returns framework will smooth prices over time, and current and future consumers will pay a cost for regulated services that reflects the benefit they derive from those regulated assets. However, if the number of consumers served by regulated assets is declining over time, then the real returns framework pushes a greater cost recovery burden onto fewer and fewer consumers. Under these circumstances, the price that future consumers pay for regulated services may not reflect the benefit they derive from the use of the regulated assets.
16. The Commission's Process and Issues paper on the DPP3 reset GPBs explains that the economic network stranding risk faced by GPBs has increased since the 2016 IMs review due to changes in Government climate change policies and technological developments.²
17. In view of these developments, we think there is a strong case for the Commission to adopt a 'nominal returns framework', whereby GPBs would be allowed to earn a nominal return on capital in each DPP/CPP period, with no subsequent indexation of GPB RABs:
 - a. A nominal returns framework would reduce the accumulation of the GPB RABs over time, thus limiting the growth of yet-to-be-recovered costs that could potentially become stranded in future. This would help contain the size of the stranding risk problem;
 - b. A nominal returns framework would also allow faster recovery of past and future investments in regulated assets. This too would limit the value of network investments that might be stranded in future;
 - c. By bringing forward RAB recovery, a nominal returns framework would also provide GPBs with cash today that could be invested in preparing to repurpose gas networks to supply consumers with alternatives to natural gas. This would help create the option of redeploying existing regulated assets to provide new services, should it become technically feasible and economic in the future to supply alternative fuels such as biogas or hydrogen;
 - d. Front-loading the recovery of the RABs using a nominal returns framework would ensure that the capital costs associated with providing the regulated services are shared between a relatively large number of consumers now, and would avoid a disproportionate cost burden falling on a declining number of consumers in the future. The last consumers to transition

² Commerce Commission, Resetting default price-quality paths for gas pipeline businesses from 1 October 2022, Process and Issues paper, 4 August 2021.



off gas networks in the future, who would bear the greatest cost burden under the deferred recovery profile of the real returns framework, may be vulnerable consumers and those that are least able to afford the costs involved in switching away from natural gas;

- e. As the Commission has previously explained, a nominal returns framework does not conflict with its policy intent to provide regulated businesses with the forward-looking expectation of real financial capital maintenance (**FCM**). Specifically, the expected net present value (**NPV**) of regulatory allowances is the same under the real and nominal frameworks, when there is no risk of asset stranding;
- f. As we show in this report, when regulated businesses face some risk of future asset stranding, then a nominal returns framework would *better* achieve the Commission's policy intent "to provide suppliers with the expectation of real FCM" than would the Commission's real returns framework. This is because, a real returns framework tends to defer the recovery of capital that could become stranded. By contrast, a nominal returns framework brings forward capital recovery (in an NPV-neutral way), thus reducing the expected RAB value that could become stranded;
- g. Allowing regulated assets to become stranded would not promote the long-term benefit of consumers, because the threat of asset stranding provides GPBs with a powerful disincentive to invest. Even firms operating in declining industries may need to make ongoing investments in order to deliver safe and reliable services to their remaining customers. It may be economically rational for regulated businesses to shut down parts or all of their networks prematurely (i.e., while demand still exists for the regulated services) rather than incur the potentially larger losses associated with asset stranding. That would result in lost consumption opportunities and economic welfare to those consumers that would be left unserved. Hence, the preservation of investment incentives is important, even in the case of industries in decline;
- h. The adoption of a nominal returns framework for GPBs is an existing approach available to the Commission to help avoid the harm to consumers that would arise if efficient investment were deterred as a consequence of unmitigated asset stranding risk; and
- i. Allowing the RABs of GPBs to become stranded may also create a chilling effect on efficient investment in other industries regulated by the Commission, by signalling that the regulatory framework does not protect investors and consumers from the consequences of economic network stranding.



2 The Commission's real returns framework

2.1 The Commission's existing framework targets and delivers real returns

18. Under the existing price-quality regulatory framework, the Commission must determine the maximum allowable revenue (**MAR**) that gas pipeline businesses are permitted to earn over each five-year DPP/ CPP period.
19. The largest component of the MAR for any GPB is the allowed return on capital. The Commission's current approach—first established in the 2010 IMs, and reaffirmed in the 2016 IMs—is to allow GPBs to earn a *real* (cash) return on capital in each DPP/ CPP period. The Commission then provides compensation to GPBs for inflation (to preserve the value of the real return on capital) by allowing the RAB to grow in line with outturn inflation.
20. This regulatory approach involves two key steps:
 - a. **Step 1. Set a real allowed return on capital to be earned within each DPP/ CPP period.**
 - i. The Commission does this by first determining a nominal return on capital allowance by multiplying the forecast RAB in each year by a nominal weighted average cost of capital (**WACC**) allowance.
 - ii. The Commission then subtracts from this figure the “expected revaluation gain” in the RAB in each year of the DPP/ CPP period, to avoid providing GPBs with compensation twice for inflation. The expected revaluation gain in the RAB is computed by multiplying the forecast RAB in each year by the Commission's estimate of expected inflation in each year.
 - b. **Step 2. Index the RAB using outturn inflation.** At the end of each DPP/ CPP period, the Commission establishes the opening RAB for the next period by rolling forward the RAB using the actual rate of CPI inflation that was realised in each year of the DPP/ CPP period.
21. In summary, the Commission deducts its estimate of *expected inflation* when setting allowed revenues for each DPP/ CPP period, and it adds back *actual* inflation when rolling forward the RAB from one DPP/ CPP period to the next.
22. The Commission has explained that this process results in a *real* return on capital allowance in each period (which is lower than the nominal return on capital computed in Step 1(i) above), with compensation for inflation (to preserve the real allowed return) provided in the form of inflation indexation of the RAB:



Effectively, our approach results in a revenue/price-path that includes a real return on capital with the revaluation of the RAB providing the compensation for inflation over the period.³

23. The Commission has also explained that this framework provides a regulatory allowance in each DPP/CPP period that, in expectation (i.e., *ex ante*), will allow investors to maintain their financial capital. The Commission refers to this as real financial capital maintenance (**FCM**). The regulatory framework then delivers (through RAB indexation using actual inflation) an *ex post* real return:

we can characterise our implementation of RAB indexation as providing an ex-ante expectation of a real return (or real FCM), and delivering an ex-post real return.⁴

24. For convenience, we refer to the Commission's existing approach as a 'real returns framework'.
25. In our experience, the use of a real returns framework is a standard regulatory approach that is employed in a number of similar jurisdictions, including Australia and the United Kingdom.

2.2 The Commission's real returns framework delays RAB recovery

26. An important consequence of the Commission's real returns framework is that it delays the recovery of the RAB. This is because part of the return that investors require in order to preserve their real return (i.e., the compensation for inflation) is effectively added to the RAB and recovered over several future DPP/CPP periods (decades) through the return on and of capital (i.e., the higher future RAB generates a higher allowed return on capital and pushes regulatory depreciation into future periods).
27. This means that regulatory depreciation plays the role of returning (via the regulated charges paid by consumers) two things to investors over time:
- a. The cost of the initial investment in the regulated assets (i.e., the opening RAB plus any subsequent capital expenditure); and
 - b. The required compensation for inflation (i.e., the actual "revaluation gains" to the RAB).
28. Since the second component—the actual revaluation gains due to inflation indexation—causes the RAB to increase over time (all else remaining equal), this effectively slows down the recovery of the first component—the initial investment in the regulated assets. That is, inflation indexation of the

³ Commerce Commission, Input methodologies review decisions, Reasons Papers, Topic paper 1: Form of control and RAB indexation for EDBs, GPBs and Transpower, December 2016, Chapter 5, p. 56.

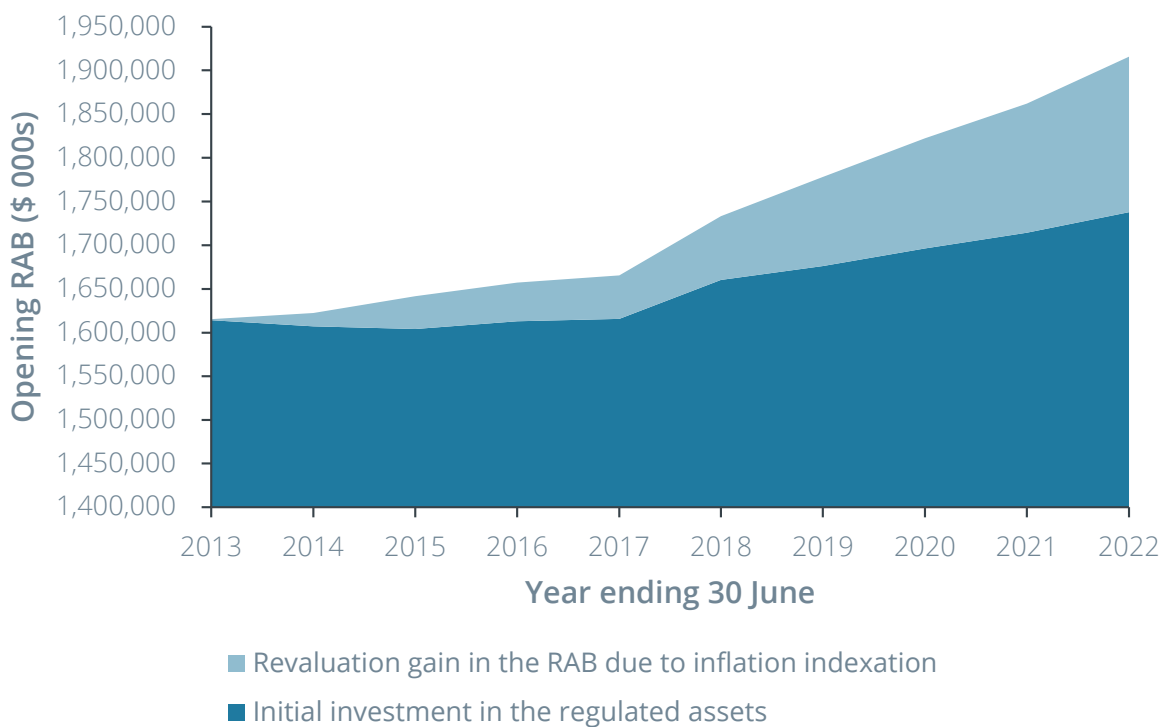
⁴ Commerce Commission, Input methodologies review draft decisions, Topic paper 1: Form of control and RAB indexation for EDBs, GPBs and Transpower, June 2016, p. 57.



RAB, which is an integral element of the Commission’s real returns framework—results in the recovery of the initial investment in the regulated assets being pushed ever further into the future.

29. This is illustrated by **Figure 1** below, which decomposes the total RAB across the GPBs into the initial investment in the regulated assets to be recovered and the revaluation gain in the RAB over time due to inflation indexation.

Figure 1: Decomposition of the total GPB RAB into the initial investment to be recovered and revaluation gain due to RAB indexation

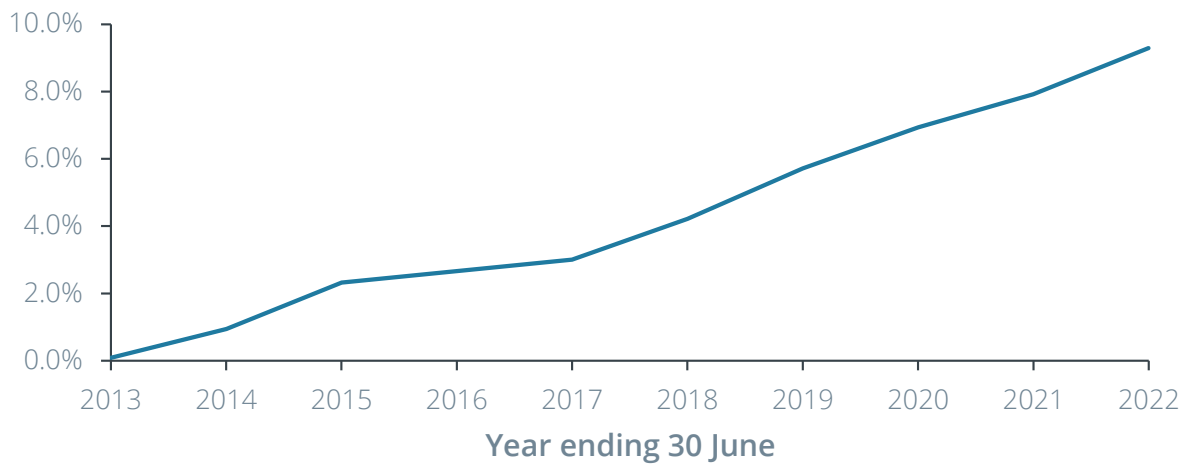


Source: Commerce Commission Financial Models for DPP1 and DPP2; Gas distribution and transmission Information Disclosure data 2013-2020; RBNZ data; Frontier Economics analysis. Note: Capex data to 30 June 2021 are actuals; capex data for the 12 months to 30 June 2022 are forecasts submitted in the Information Disclosures.

30. The Figure above shows that the total value of the GPB RABs as at 30 June 2021 was nearly \$1.9 billion. Approximately 8% of the total GPB RAB value at that time (nearly \$148 million) was attributable to RAB indexation since 2013. Had no inflation indexation been applied, the RAB value as at 30 June 2021 would have been just under \$1.7 billion. Put another way, under a nominal returns framework, the GPB RAB value as at 30 June 2021 would have been approximately \$148 million lower than it was under the real returns framework, without consumers paying any more (in NPV terms) over the expected life of the assets.
31. **Figure 2** below shows that the revaluation gain component of the total RAB value has grown significantly over time. As the revaluation gain component grows, recovery of the initial investment in the regulated assets will slow.



Figure 2: Revaluation gain due to inflation indexation as a proportion of total GPB RAB



Source: Commerce Commission Financial Models for DPP1 and DPP2; Gas distribution and transmission Information Disclosure data 2013-2020; RBNZ data; Frontier Economics analysis.

32. During the 2010 IMs review, the Commission recognised that RAB indexation has the effect of slowing the recovery of the investment in regulated assets:

If no indexation was applied to RAB values, then cash flows generated by each asset would be brought forward because depreciation in the earlier years would be higher. Such an approach would be consistent with suppliers having sufficient cash flows to finance their debt obligations, and would generally result in a more rapid recovery of the value of each supplier's investments.⁵

33. In our view, the Commission's real returns framework may be appropriate when regulating businesses that face no material risk of future asset stranding (and no immediate cash flow or financeability constraints). However, as we discuss in the next section, a real returns framework that defers cost recovery is not appropriate for industries facing the risk of significant decline in demand and/or supply that could result in significant stranding of regulated assets.

⁵ Commerce Commission, Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper, December 2010, p. 117.



3 The case for using a nominal returns framework for gas networks

3.1 GPBs are facing increasing stranding risk

34. The DPP3 review will occur against a backdrop of potentially significant Government policy change and uncertainty for the gas industry.
35. New Zealand's *Climate Change Response (Zero Carbon) Amendment Act 2019* set a target of achieving net zero emissions of all greenhouse gases, except for methane emissions from agriculture and waste, by 2050.
36. In May 2021, the Climate Change Commission provided its final first round of advice to the Government on moving New Zealand towards the 2050 net zero target. The Climate Change Commission has tempered somewhat the draft advice in relation to reducing New Zealand's reliance on natural gas ("fossil gas"). Nevertheless, the Climate Change Commission concludes in its final advice that a "critical outcome that Aotearoa will need to achieve" is:

Phasing out new fossil gas connections and switching existing fossil gas appliances to low emissions fuels.⁶

37. The final advice also states that:

After reviewing the evidence, we still concluded that the continued expansion of the network for fossil gas was not warranted. We have acknowledged that low-emissions gases, such as hydrogen and biogas, may play a useful role in reducing emissions in the future. We have also recommended more work is needed to manage the diminishing role of fossil gas across the energy system and recognised that stakeholders want more input into how this will be achieved.⁷

38. Hence, the Climate Change Commission's advice to the Government appears to be that the expansion of gas networks should be halted, and that efforts should be made to switch end-users away from the use of natural gas.

⁶ Climate Change Commission, *Ināia tonu nei: a low emissions future for Aotearoa*, May 2021, p. 130.

⁷ Climate Change Commission, *Ināia tonu nei: a low emissions future for Aotearoa*, May 2021, p. 30.



39. The Commission's Process and Issues paper on the DPP3 reset GPBs explains that the economic network stranding risk faced by GPBs—i.e., the risk that the GPBs may not recover fully their investments in regulated assets—has increased since its last IMs review in 2016 due to a number of factors, including:⁸
- a. Shifting Government climate change policies that may impact:
 - i. the supply of natural gas (e.g., due to the Government's 2018 decision to issue no further offshore oil and gas exploration permits; and
 - ii. the demand for natural gas (e.g., due to the New Zealand Emission Trading Scheme that has resulted in the rising carbon prices, and the Climate Change Commission's advice, which if adopted by the Government would reduce gas use in New Zealand materially); and
 - b. Technological developments that may:
 - i. Improve the cost effectiveness of electricity for end-users, potentially accelerating the transition away from gas; and
 - ii. Determine whether existing gas networks may be repurposed to supply alternative fuels to natural gas, such as hydrogen.
40. For instance, the Commission states that:

*Economic network stranding risk for GPB assets has increased since the 2016 IM review.*⁹

41. And that:

*There is a risk that GPBs will be unable to, at some point in the future, fully recover their historic capital investment as customers disconnect from GPB networks.*¹⁰

42. The Process and Issues paper also recognises that asset stranding risk is one of the key challenges that the Commission will need to address during the DPP3 reset.

⁸ Commerce Commission, Resetting default price-quality paths for gas pipeline businesses from 1 October 2022, Process and Issues paper, 4 August 2021.

⁹ Commerce Commission, Resetting default price-quality paths for gas pipeline businesses from 1 October 2022, Process and Issues paper, 4 August 2021, p. 78.

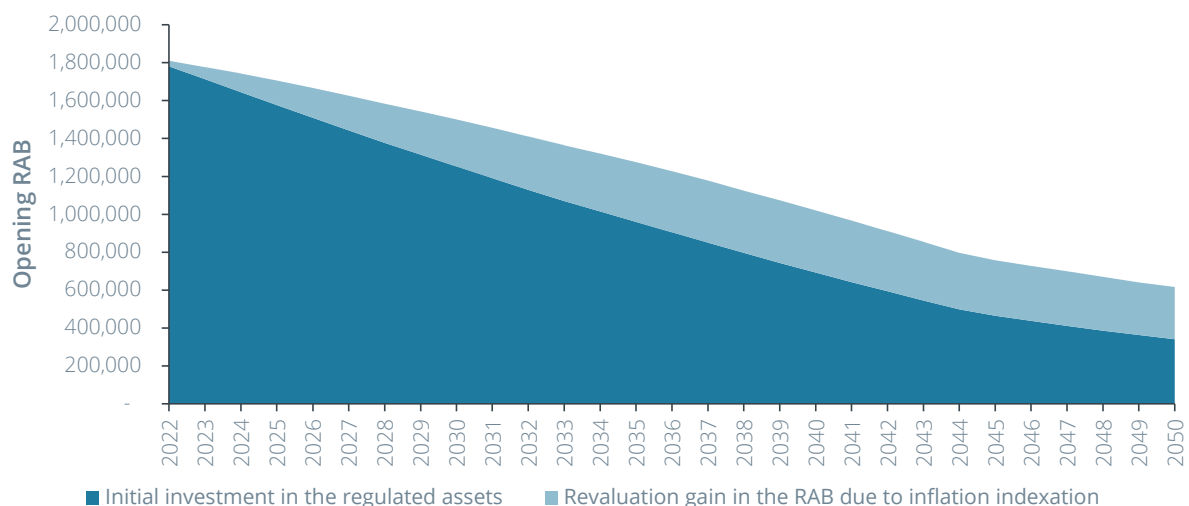
¹⁰ Commerce Commission, Resetting default price-quality paths for gas pipeline businesses from 1 October 2022, Process and Issues paper, 4 August 2021, p. 6.



3.2 The extent of economic network stranding faced by GPBs is likely to be very material

43. The extent of economic network stranding faced by GPBs is likely to be very material, and is amplified by the application of a real returns framework. **Figure 3** plots how the cumulative RABs of the GPBs would evolve if they were to be rolled forward from current levels, and assuming the following:
- The GPBs invest no further capital in network assets (i.e., nil future capex) beyond 2021;
 - The remaining asset life for existing assets in each asset class is determined using the method described in Appendix A;
 - The RABs are indexed for inflation and actual inflation turns out to be 2.0% per annum in all future years;¹¹ and
 - The assets become stranded in 2050 (i.e., New Zealand’s net zero target year).

Figure 3: Roll forward of total GPB RABs assuming no additional capex beyond 2021



Source: Commerce Commission GPB financial model for DPP2; GPB Information Disclosures; Frontier Economics analysis

44. The key assumptions underpinning **Figure 3** are very conservative. For instance, it is very unrealistic that the GPBs could continue to operate their networks to 2050 safely and reliably without incurring any additional capital expenditure. Furthermore, it is plausible that the existing gas networks could become stranded well before 2050.
45. However, even under these very conservative assumptions, the Figure above shows that the total unrecovered RAB value across all GPBs in 2050 would be more than \$616 million. Of that amount, roughly \$275 million would have been due to the indexation of the RAB under the real returns framework. That is, in the absence of RAB indexation, the possible RAB value that would be

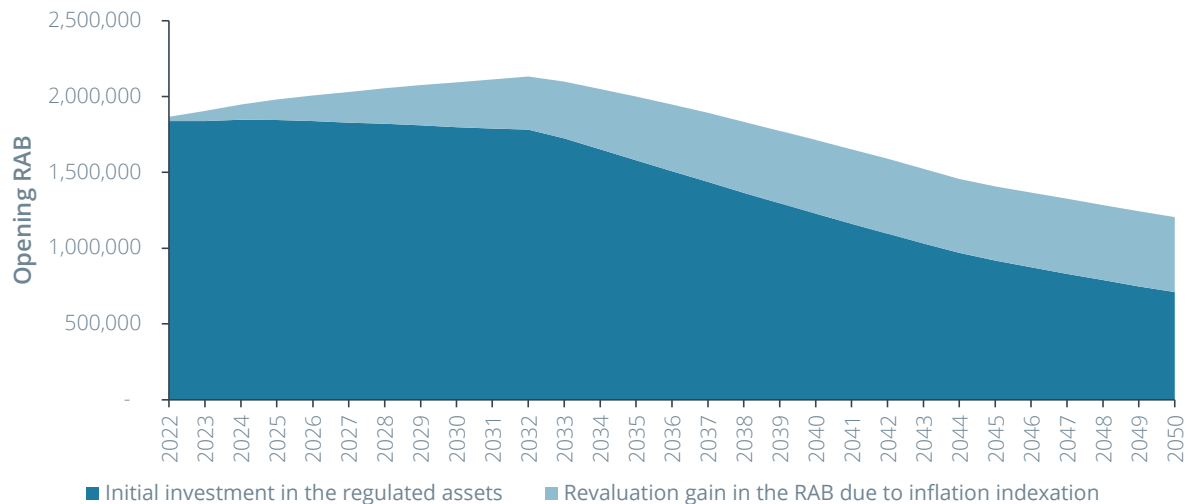
¹² The Commission’s inflation forecasts are generally very close to 2.0% per annum, the midpoint of the RBNZ’s inflation target range.



stranded by 2050 (under the assumptions outlined above) would be \$341 million across the industry.

46. The potential RAB value that could be stranded by 2050 would clearly be significantly greater than these amounts if the GPBs were to invest further capital in the regulated assets. This can be seen in **Figure 4** below.

Figure 4: Roll forward of total GPB RABs assuming only reliability and safety capex beyond 2021



Source: Commerce Commission GPB financial model for DPP2; GPB Information Disclosures; GPB Asset Management Plans; Frontier Economics analysis

47. **Figure 4** assumes that:
- From 2021 onwards, GPBs invest only what is required in order to operate their networks safely and reliably. Specifically, we assumed that the GPBs would invest only the forecast reliability and safety capital expenditure (i.e., excluding any capital expenditure relating to consumer connections and system growth) up to 2031 as reported in the GPBs in their 2021 Asset Management Plans.¹² In order to be conservative, and to avoid making any of our own forecasts, we assumed that no capital expenditure would be made by the GPBs beyond 2031;
 - The remaining asset life for existing assets in each asset class is determined using the methodology specified in the GPB IMs and used by the Commission when determining the MAR for each DPP period;
 - Any new capital expenditure is depreciated using the Commission’s standard 45-year asset life assumption;
 - The RABs are indexed for inflation and actual inflation turns out to be 2.0% per annum in all future years (as above); and
 - The assets become stranded in 2050 (as above).

¹³ Powerco and Firstgas furnished us with their 2021 AMPs directly as these had not been published at the time we were preparing this report.



48. Under these assumptions, **Figure 4** suggests that there could be over \$1.2 billion in unrecovered GPB RAB value by 2050. Of this, roughly \$494 million would be due to RAB indexation (assuming outturn inflation of 2.0% per annum). The unrecovered RAB value that is not due to inflation indexation would be approximately \$710 million.
49. An unrecovered RAB value of \$1.2 billion in 2050 would be equivalent to approximately \$321 million in present value terms, using the Commission's latest WACC estimate of 4.83% for GPBs.¹³ This would represent approximately 17% of the total GPB RAB (nearly \$1.9 billion) as at 30 June 2021. Economic network stranding of this scale would be very material.
50. These estimates are conservative, once again, because we have assumed that GPBs do not invest in their networks beyond 2031 (even to maintain safety and reliability), and that stranding would occur no earlier than 2050. If either or both of these assumptions do not hold, the GPB RAB value that could be stranded is likely to be even greater than the estimates reported above.

3.3 Economic network stranding does not promote the long-term benefit of consumers

51. The purpose of the regulatory regime is set out in s 52A of the Commerce Act, as follows:

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.

52. Thus, the central purpose of Part 4 of the Commerce Act is to promote the long-term benefits of consumers, which is achieved by promoting outcomes that are consistent with those produced in competitive markets.

¹³ Commerce Commission, Cost of capital determination for disclosure year 2022 for information disclosure regulation For Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year -end), 2 August 2021, Table 2. We have adopted the Commission's 67th percentile estimate of the nominal vanilla WACC.



53. In this regard, the Commission itself has observed that the objectives of s 52A are best achieved by seeking to replicate the outcomes of a workably competitive market:

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– The central purpose [to promote the long-term benefit of consumers] is to be achieved by promoting outcomes consistent with those produced in workably competitive markets. The Commission has therefore sought to identify the outcomes typically produced in workably competitive markets. The IMs are designed to promote, in the regulated markets, outcomes consistent with those in workably competitive markets such that the objectives set out in s 52A(1)(a)-(d) of the Act are achieved.¹⁴

54. The High Court has considered the nature of workable competition in relation to Part 4 of the Act and concluded as follows:

Prices in workably competitive markets may never exactly reflect efficient costs, including a normal rate of return.

But the tendencies in workably competitive markets are towards such returns and prices. By themselves, these tendencies will also lead towards incentives for efficient investment (investment that is reasonably expected to earn at least a normal rate of return) and innovation. That is to say, the prices that tend to be generated in workably competitive markets will provide incentives for efficient investment and for innovation.

The same tendencies towards prices based on efficient costs and reasonable rates of return will lead also to improved efficiency, provision of services reflecting consumer demands, sharing of the benefits of efficiency gains with consumers, and limited ability to extract excessive profits.¹⁵

55. That is, the objectives of Part 4 of the Commerce Act are best promoted by setting regulatory allowances (and consequently consumer prices) in a manner that is consistent with the expectation of the full recovery of efficient costs and normal rates of return.
56. During the 2010 IMs review, the Commission explained that in order for regulated businesses to invest efficiently in assets that will deliver the regulated services that consumers value, they must have an expectation of earning a normal return on their investments, *and an expectation of recouping their original investment in full* (through the return of capital) over the lifetime of the assets:

¹⁴ Wellington International Airport Ltd & Ors v Commerce Commission [2013] NZHC [11 December 2013], para 233.

¹⁵ Wellington International Airport Ltd & Ors v Commerce Commission [2013] NZHC [11 December 2013], paras 19-21.



*In order for firms to invest in long-lived, specialised assets, they must have an expectation that they will be able to earn a normal return on, **and a return of, their investment over the asset's lifetime.***¹⁶ [Emphasis added]

57. The Commission explained further that in circumstances where regulated businesses face the threat of asset stranding (e.g., due to a significant decline in future demand), then regulatory action to ensure that the businesses are compensated for any associated losses would preserve the incentives to invest efficiently, and would be consistent with the Part 4 purpose of promoting the long-term benefit of consumers:

*In workably competitive markets, firms account for the risk of stranding ex ante through their expected return on the project. In a regulatory context, where demand for services supplied by an asset falls away for reasons beyond the supplier's control, ensuring the supplier is compensated for any losses it incurs protects incentives for new investment, consistent with s 52A(1)(a). This is particularly important where the assets involved are large, and long-lived.*¹⁷

58. We agree with the Commission's reasoning above.
59. We note that even firms operating in declining industries may need to make ongoing investments (e.g., maintenance and refurbishment of assets) in order to deliver safe and reliable services to their remaining customers. However, regulated businesses will be disincentivised to make those necessary and valuable investments if they face a material risk of being unable to recover the cost of those investments. If the expected costs of asset stranding faced by regulated businesses are sufficiently large, then it may be economically rational for those businesses to minimise their losses by shutting down parts or all of their networks prematurely (i.e., while demand still exists for the regulated services). That would result in lost consumption opportunities and economic welfare to those consumers that would be left unserved.
60. Furthermore, given the current uncertainty about whether and to what extent existing gas network assets could be repurposed to supply alternative fuels in the future, it may be to the long-term benefit of consumers to continue to operate the existing networks to:
- a. Preserve the option of repurposing the networks in the future, if it becomes technically feasible and economic to do so; and
 - b. Test the viability of using the existing network assets in new ways in the future (e.g., by conducting hydrogen network trials, biogas injection trials, etc.).

¹⁶ Commerce Commission, Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper, December 2010, p. 337.

¹⁷ Commerce Commission, Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper, December 2010, p. 337.



61. However, shutting down the existing networks prematurely (because GPBs do not have a realistic expectation that they will recover the investments required in order to operate the networks reliably and safely) may extinguish the option to repurpose existing regulatory assets in ways that would be valuable to consumers over the long-term.
62. Hence, the preservation of investment incentives is important, even in the case of industries in decline.
63. In summary:
 - a. The singular purpose of the Commission's regulatory framework is to promote the long-term benefit of consumers;
 - b. Part 4 of the Commerce Act provides that one of the ways in which the Commission must promote the long-term benefit of consumers is by ensuring that regulated business have incentives to innovate and to invest;
 - c. The Commission has recognised that regulated businesses will invest efficiently only if they expect to earn a normal return on their capital and recover their investments in full; and
 - d. The Commission has concluded previously that it would be consistent with the Part 4 purpose of promoting the long-term benefit of consumers to compensate regulated businesses for any losses they may incur due to asset stranding as a means to protect incentives for new investment.

3.4 A nominal returns framework can help mitigate asset stranding risk

64. The Commission's Process and Issues paper notes that some stakeholders had proposed the removal of inflation indexation of the RAB as one option for addressing the increased stranding risk faced by GPBs.
65. If inflation indexation of the RAB were removed, then the Commission would need to provide GPBs with a nominal return on capital allowance in each DPP/CPP period, in order to ensure that (in expectation) investors receive sufficient compensation for inflation in order to preserve their real required return on capital. This could be achieved by no longer subtracting from the return on capital allowance in each DPP/CPP period the expected revaluation gain in the RAB.
66. Because such an approach would deliver a nominal return on capital allowance in each DPP/CPP period, we refer to such an approach as a 'nominal returns framework'.
67. During the 2010 IMs review, the Commission considered the application of a nominal returns framework for GPBs, and noted that there would be a case for using such an approach if GPBs faced material stranding risk. However, the Commission concluded at that time that there was no evidence of the GPBs facing material stranding risk, so decided not to adopt a nominal returns framework:



Those suppliers that would receive higher cash flows under an un-indexed approach would potentially face reduced risks because less capital would remain to be recovered in future (i.e. the RAB value would reduce more quickly).

To the extent that suppliers will be unable to recover the full RAB value in future— e.g. if demand was going to fall away entirely—then this would argue in favour of a faster recovery profile than that implied by CPI-indexation. At present, however, assets used to supply regulated services are trading at a premium above the RAB value. Investors in these assets therefore appear to expect to recover at least the RAB value of the assets used to supply regulated services.¹⁸

68. The application of a nominal returns framework to GPBs (and, indeed, any other regulated business facing material stranding risk) would help address stranding risk in two ways:
- First, it would reduce the accumulation of the RABs over time, thus limiting the growth of yet-to-be-recovered costs that could potentially become stranded in future. That is, ceasing the indexation of the GPB RABs would help limit the size of the stranding risk problem; and
 - Second, as noted by the Commission in the quote above, adoption of a nominal returns framework would allow faster recovery of past and future investments in regulated assets. This too would limit the value of network investments that might be stranded in future.
69. The Process and Issues paper identifies a number of other options for addressing GPB RAB stranding risk over DPP3, such as shortening asset lives and providing *ex ante* allowances to compensate investors for bearing increased stranding risk. We note that:
- If the scale of asset stranding faced by GPBs is very large, adoption of a nominal framework alone may be insufficient to mitigate the stranding risk problem fully. It may be necessary to adopt a combination of measures—such as a nominal returns framework coupled with accelerated depreciation through the shortening of asset lives—to ensure full recovery of GPBs' RABs;
 - Adoption of a nominal returns framework would be a complement to, rather than an alternative to, any of the other approaches identified by the Commission. A key benefit of the nominal returns framework is that would reduce the extent to which the RAB grows over time. This would mean that there would be less RAB value in future years that needs to be recovered. Consequently, adoption of a nominal returns framework would allow more effective cost recovery to occur via accelerated depreciation. By contrast, maintaining a real returns framework would hinder cost recovery via accelerated depreciation, by allowing inflation indexation to continue to add to the RABs over time.
 - The individual approaches to address asset stranding risk identified by the Commission, and combinations of those approaches, could be implemented so as to generate the same expected NPV, consistent with the Commission's FCM objective.

¹⁸ Commerce Commission, Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper, December 2010, p. 117.



3.5 A nominal returns framework does not undermine the Commission's policy intent behind a real returns framework

70. During the 2016 IMs review, the Commission clarified that the policy intent underpinning its approach of applying a real returns framework (which involves RAB indexation) to GPBs was to provide these businesses with the *ex ante* expectation of real FCM (rather than to deliver an *ex post* real return):

Our policy intent is to provide suppliers with the expectation of real FCM. Where our forecasts (including of the CPI) are unbiased, we are clear that real FCM is expected on an ex-ante basis.

For EDB/GPBs, our approach to RAB indexation offers an ex-ante expectation of a real return (or real FCM), and delivers an ex-post real return (or real FCM). This results in an outcome where both consumers and suppliers are protected from inflation risk.¹⁹

71. In the 2010 IMs review, the Commission decided to apply a nominal returns framework to Transpower because the resulting front-loading of capital recovery would better match the cash flow requirements of the business, which was undertaking a major investment programme at the time.²⁰
72. During the 2016 IMs review, the Commission assessed whether it should continue to apply a nominal framework for Transpower, and sought expert advice from Dr Lally on the matter. The Commission and Dr Lally concurred that the application of a nominal returns framework does not violate the real FCM principle, which the Commission notes is sometimes referred to as the NPV=0 principle:²¹

we can characterise Transpower's regime as providing an ex-ante expectation of a real return (or real FCM), and delivering an ex-post nominal return.

Referring to the approach we apply to Transpower, Lally concludes that "Following the same type of analysis presented above, it can be shown that this too does not violate the NPV=0 principle."

NPVs are forward-looking and therefore deal with expected future outcomes rather than their actual outcomes. Therefore, it is consistent to say that the Transpower regime provides an ex-ante

¹⁹ Commerce Commission, Input methodologies review decisions, Reasons Papers, Topic paper 1: Form of control and RAB indexation for EDBs, GPBs and Transpower, December 2016, Chapter 5, p. 60.

²⁰ Commerce Commission, Input methodologies (Transpower), Reasons Paper, December 2010, pp. 29-30.

²¹ Commerce Commission, Input methodologies review decisions, Reasons Papers, Topic paper 1: Form of control and RAB indexation for EDBs, GPBs and Transpower, December 2016, Chapter 5, p. 61.



expectation of a real return and that it does not violate the ex-ante NPV=0 principle, even though it delivers an ex-post nominal return that may differ from the NPV=0 expectation.²²

73. That is, the Commission and Dr Lally clarified that *both* the real returns framework *and* the nominal returns framework target a real *ex ante* real return and, therefore, provide investors with the expectation of real FCM. This reaffirmed a similar conclusion reached by the Commission during the 2010 IMs review:

the use of a nominal WACC with a non-revalued asset base is consistent with FCM²³

74. Since the real returns framework and the nominal returns framework both provide investors with the expectation of real FCM (i.e., they both produce an NPV=0 outcome), the application of a nominal returns framework would achieve the Commission's stated policy intent just as well as the use of a real returns framework.
75. During the 2016 IMs review, the Commission decided to maintain its 2010 IMs approach of not indexing Transpower's RAB—partly because doing so (without concurrently shortening its asset lives) would expose Transpower to greater asset stranding risk by back-loading the recovery of Transpower's RAB at a time it faced competitive threats from emerging technologies:

The uncertainty around capital recovery resulting from emerging technologies means that indexing Transpower's RAB is not consistent with our approach to shortening asset lives for EDBs. To be consistent we would have to allow an equivalent treatment for Transpower, but this would add complexity for a similar outcome to that achieved under no RAB indexation.²⁴

76. That is, the Commission considered that non-indexation of the RAB assisted in mitigating the potential risk of future asset stranding. It would seem that this reasoning would argue in favour of adopting a nominal returns framework for GPBs, now that the Commission has recognised that the stranding risk faced by these businesses has increased since 2016.

²² Commerce Commission, Input methodologies review draft decisions, Topic paper 1: Form of control and RAB indexation for EDBs, GPBs and Transpower, June 2016, p. 61.

²³ Commerce Commission, Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper, December 2010, p. 45.

²⁴ Commerce Commission, Input methodologies review decisions, Reasons Papers, Topic paper 1: Form of control and RAB indexation for EDBs, GPBs and Transpower, December 2016, Chapter 6, p. 71.



3.6 The Commission's concerns over the adoption of a nominal returns framework

77. The Commission states in the Process and Issues paper that adoption of a nominal returns framework is less justified than other options (e.g., shortening of asset lives, or application of an ex ante allowance to compensate for greater stranding risk) for addressing the increase in asset stranding risk faced by GPBs:

While removal of indexation is an existing tool available to us and making such a change would have the effect of bringing forward cash flows, there is less justification for doing so to address increased economic network stranding risk (relative to the other approaches discussed above). The effective adjustment in risk may not appropriately reflect the magnitude of the change in risk or who is most able to manage the within period risk.²⁵

78. The Commission's main concern appears to be that the adoption of a nominal returns framework would impose more risk on certain groups. The Process and Issues paper does not explain how adoption of a nominal returns framework would result in an "effective adjustment in risk." However, the Commission has explained previously that because its real returns framework delivers, *ex post*, what it determines to be the real return required by investors, it protects both consumers and suppliers from inflation risk:

[The real returns framework] delivers real FCM for capital holders collectively, protecting consumers and suppliers from inflation risk.²⁶

79. The nominal returns framework may deliver a real return that is higher or lower than the Commission's estimate of the real return required by investors. That is, investors might be over/under-compensated (relative to the Commission's assessment of the true required real return), and consumers may pay more or less than the efficient price, if actual inflation differs from investors' inflation expectations. In that sense, the Commission is correct that under a nominal returns framework, investors and consumers bear some inflation risk.
80. However, this inflation risk relates only to the short-term (i.e., individual DPP/PPP periods). There is no reason to think that the real *ex post* returns received by investors under a nominal returns framework will be systematically higher or lower than the true return actually required by investors

²⁵ Commerce Commission, Resetting default price-quality paths for gas pipeline businesses from 1 October 2022, Process and Issues paper, 4 August 2021, p. 85.

²⁶ Commerce Commission, Input methodologies review decisions, Reasons Papers, Topic paper 1: Form of control and RAB indexation for EDBs, GPBs and Transpower, December 2016, Chapter 5, p. 69.



over the *long-term* (i.e., over the life of the assets), or those delivered by the real returns framework (provided the Commission's estimates of the real required return are unbiased).

81. The Commission itself has made this very point, when it noted that the nominal and real returns frameworks produce expected outcomes that are equivalent in NPV terms (all else remaining equal):

*As noted above (paragraph 2.6.28), FCM requires that regulated suppliers are compensated for the impact of economy-wide inflation over time. Where a nominal cost of capital is used, the value of any existing asset in the RAB does not need to be revalued to reflect changes in economy-wide inflation for the supplier's financial capital to be maintained in real terms. Alternatively, however, regulated suppliers can also be compensated for inflation by applying a cost of capital calculated in real terms and by indexing the value of the RAB by the CPI. **The two approaches are equivalent in present value terms when assessed over the lifetime of the assets.**²⁷ [Emphasis added]*

82. The point made by the Commission in the quote above can be illustrated using the following simple numerical example. Consider a regulated business with an opening RAB of \$100, with a guaranteed asset life of 10 years. For simplicity, we assume that the business incurs no operating or capital expenditure over the period, and pays no corporation tax.
83. We consider two ways in which the regulator may set allowances for the businesses:
- The regulator applies a nominal returns framework. Under this approach, the regulator determines a nominal WACC allowance of 5.0% in each year, and no inflation indexation is applied to the RAB.
 - The regulator applies a real returns framework. Under this approach, the regulator determines that investors require a nominal WACC of 5.0% in each year, and forecasts inflation correctly to be 2.0% per annum, such that the estimated real required WACC is 3.0% each year. Since the regulator forecasts inflation perfectly, the RAB is indexed using actual inflation of 2% per annum.
84. **Table 1** in Appendix B to this report calculates the total return (i.e., the sum of the return on capital and the return of capital) received by this regulated business over its asset life under both approaches. The Table shows that the NPV of the total returns received by the business under the nominal returns framework and the real returns framework are identical. In both scenarios, the business recovers its RAB of \$100 fully (in NPV terms) over the 10-year life of the asset.
85. However, because a nominal returns framework front-loads the recovery of costs, relative to a real returns framework, when the regulated business faces some stranding risk, then the two approaches will *not* produce expected outcomes that are equivalent in NPV terms. Specifically, the expected present value of costs recovered under a real returns framework will be *lower* than the expected present value of costs recovered under a nominal returns (all else remaining equal), if the business faces some stranding risk—because the recovery of some costs under the former will

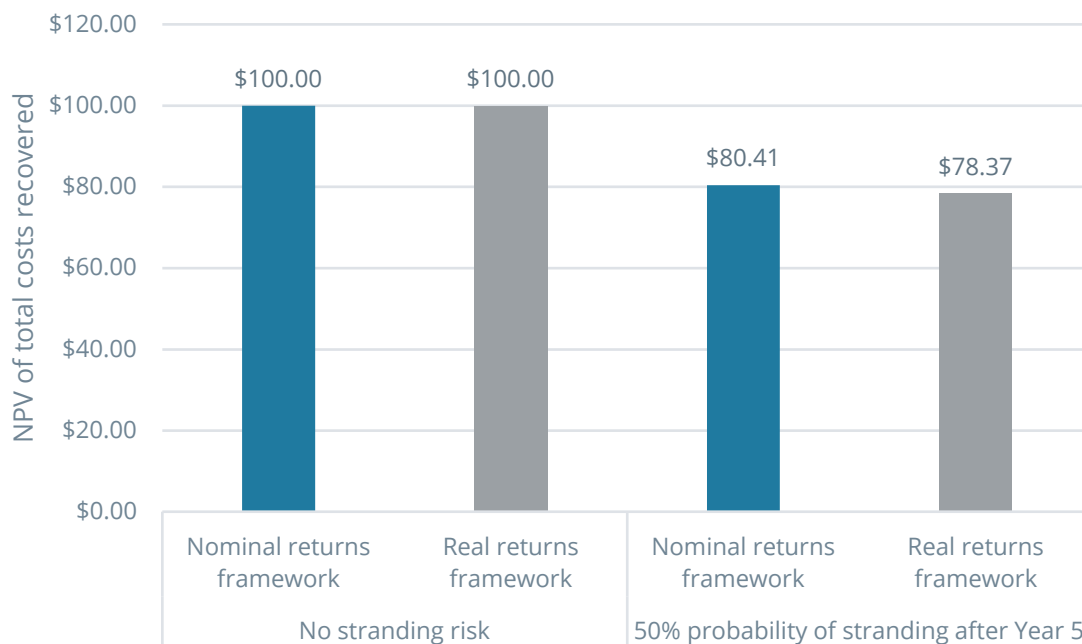
²⁷ Commerce Commission, Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper, December 2010, p. 45.



be deferred and, in expectation, stranded. In other words, the real returns framework pushes more value into the future RAB, which is at risk of being stranded.

86. This can be seen in **Table 2** (also in the Appendix), which calculates the expected total return received by this regulated business over its asset life under the nominal and real return frameworks, assuming that there is a 50% probability of the regulated assets becoming stranded completely beyond Year 5.²⁸ The Table shows that the business is expected to only recover part of its RAB under both approaches. However, the loss in NPV (and the violation of FCM) is greater under the real returns framework than under the nominal returns framework.
87. The preceding analysis (which is summarised in **Figure 5** below) shows that:
- When there is no risk of future asset stranding, the nominal and real returns frameworks produce expected outcomes that are equivalent in NPV terms (all else remaining equal). The Commission has itself recognised this point. Therefore, if there is no realistic prospect of asset stranding, and the Commission’s inflation forecasts are unbiased, there is no reason to expect regulated businesses or consumers to be systematically better or worse off, over the life of the regulated assets, under either approach; however
 - When the business faces some risk of future asset stranding, then it would be expected to recover less (in present value terms) of its investment in the regulated assets under a real returns framework than under a nominal returns framework. This suggests that when there is some possibility of future asset stranding, a nominal returns framework would better achieve the Commission’s policy intent “to provide suppliers with the expectation of real FCM” than would the Commission’s real returns framework.

Figure 5: Cost recovery under the nominal returns framework – with and without stranding risk



Source: Frontier Economics analysis

²⁸ That is, from Year 6 onwards, there is a 50% chance that the business will receive no return on or of capital.



88. As explained in section 3.3, regulatory asset stranding outcomes do not promote the long-term benefit of consumers because the expectation of such outcomes is likely to deter efficient investment in assets that deliver regulated services that consumers value.
89. Hence, when faced with the risk of network asset stranding, regulated business and consumers would be better off over the long-term under a nominal returns framework.
90. As the Commission has explained, a regulatory framework that creates the expectation of FCM is essential to preserving incentives for efficient investment:

A key consideration for investment incentives is our FCM pricing principle which states that we should provide regulated suppliers the ex-ante expectation of earning their risk-adjusted cost of capital (a 'normal return'). This provides suppliers with the opportunity to maintain their financial capital in real terms over timeframes longer than a single regulatory period.²⁹

91. In the Process and Issues paper, the Commission states that one of the principles it will have regard to during the DPP3 review (in order to promote the purpose of Part 4 of the Commerce Act) is that the harms faced by consumers due to under-investment are likely to be greater than the harms faced by consumers due to over-investment:

Asymmetric consequences of over- and under-investment: we apply FCM recognising that usually there are asymmetric consequences to consumers of regulated energy services, over the long-term, of under-investment.³⁰

92. This is a principle that the Commission has affirmed several times (including during previous IM reviews), and one that we support.
93. Therefore, we agree with the view expressed by the Commission in the Process and Issues paper that prices may need to increase over DPP3 in order to promote the long-term benefit of consumers:

Despite indicators that costs have fallen, having consumers' prices decrease from DPP2 to DPP3 may not be in the long-term interest of consumers. This is because if demand declines in the future (faster than costs decline), prices may need to increase to maintain an expectation of FCM. Given the high

²⁹ Commerce Commission, Resetting default price-quality paths for gas pipeline businesses from 1 October 2022, Process and Issues paper, 4 August 2021, p. 77.

³⁰ Commerce Commission, Resetting default price-quality paths for gas pipeline businesses from 1 October 2022, Process and Issues paper, 4 August 2021, p. 19.

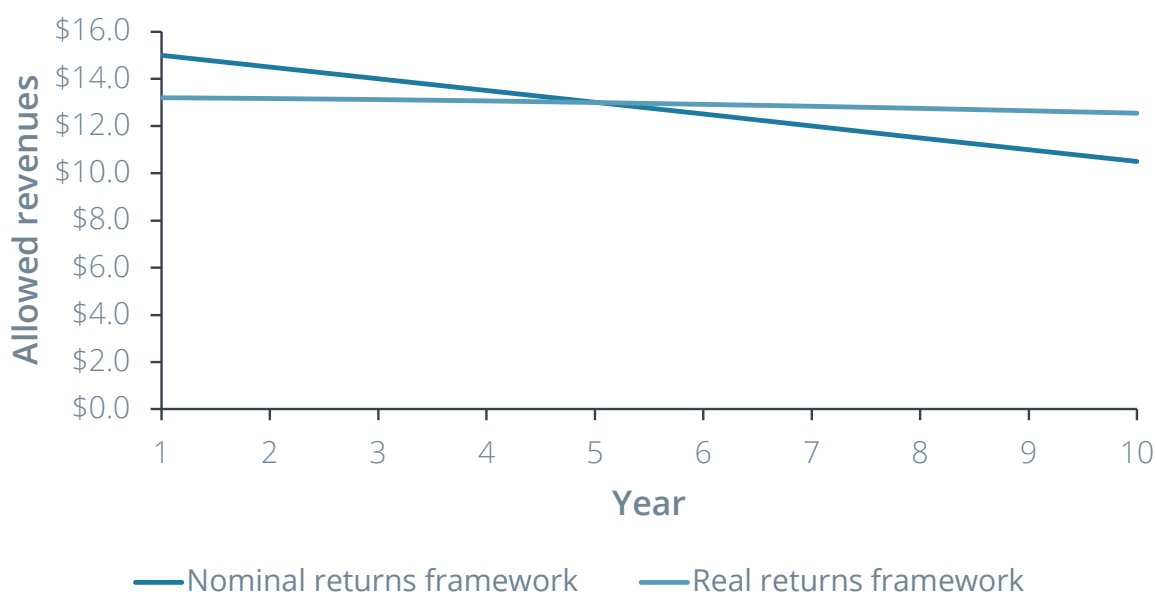


degree of uncertainty facing the industry, it may be in the long-term interest of consumers to have higher prices now, if it reduces the chance of prices escalating in the future.³¹

3.7 Intergenerational equity and the cost recovery burden placed on different cohorts of consumers

94. A benefit of the nominal returns framework is that it promotes intergenerational equity between current and future consumers in circumstances where demand is expected to decline over time.
95. This can be seen with the help of **Figure 6** below, which plots allowed revenues under the real and nominal returns frameworks using the stylised example developed in section 3.6 above. The Figure shows that the real returns framework produces a flatter profile of allowed revenues over time than does the nominal returns framework (all else remaining equal)—since the nominal returns framework front-loads cost recovery.

Figure 6: Time profile of allowed revenues under the real and nominal returns frameworks



Source: Frontier Economics

96. Given the relatively flat time profile of allowed revenues produced by the real returns framework, when demand for regulated services is relatively stable over time, the real prices for the regulated services paid by each consumer using the network will also be relatively stable.
97. However, if the number of consumers using the regulated services is expected to decline over time, then the cost paid by each consumer under the real returns framework will increase over time. That is, the real returns framework would transfer more of the cost recovery burden on future

³¹ Commerce Commission, Resetting default price-quality paths for gas pipeline businesses from 1 October 2022, Process and Issues paper, 4 August 2021, p. 45.



cohorts of consumers than current consumers. This may mean that economic welfare derived by future consumers (i.e., the difference between their willingness to pay and the cost they actually pay) is likely to be smaller than the economic welfare derived by current consumers. That is, future consumers are likely to be worse off than current consumers under a real returns framework, if demand is expected to decline over time.

98. Furthermore, it may be that the last consumers to transition away from use of natural gas are vulnerable consumers who are less able to afford the switching costs involved in doing so (e.g., the cost of replacing appliances), or those with less control or choice over their fuel source (e.g., renters). It may be these consumers that bear the greatest costs (by way of a reduction in economic welfare) under the real returns framework.
99. By contrast, a nominal returns framework would produce more stable prices across current and future cohorts of consumers when demand is expected to decline over time, since allowed revenues would decline as the number of consumers falls. This is likely to produce better intergenerational equity outcomes, since the resulting economic welfare derived by consumers of regulated services would be smoother over time. Future consumers (including those who are last to transition off the network) would not shoulder a disproportionately large cost recovery burden, and would therefore not be materially worse off than current consumers.

3.8 Implementation of a nominal returns framework

100. When considering whether to switch from a real to a nominal returns framework, the Commission may wish to consider the following implementation questions?
 - a. How simple would it be to switch from a real returns framework to a nominal returns framework?
 - b. Is it feasible to consult properly on the change before DPP3?
101. In relation to the first question, we note that the practical steps involved in switching from a real returns framework to a nominal returns framework for GPBs would be relatively straightforward. Apart from the required redrafting of the relevant parts of the GPB IMs, the Commission would need to make a small number of minor changes to:
 - a. the financial model it uses for the purposes of determining the MAR; and
 - b. the IDs,to determine a nominal return on capital in each DPP/CPD period and eliminate any future RAB indexation.
102. It would be straightforward to make these necessary changes, particularly since the Commission already applies a nominal returns framework to Transpower—so the required changes could be adapted from the models the Commission already uses for Transpower.



103. In relation to the second question, since a switch from a real returns framework to a nominal returns framework would require a change to the IMs,³² the Commission would need to consult with stakeholders before making any such change.
104. Such a consultation could be conducted within a relatively short period of time since:
 - a. The issue is well-defined and self-contained (i.e., it does not have broader implications for other aspects of the GPB IMs); and
 - b. The Commission has already consulted on most of the relevant issues through previous IM reviews, and the issues are well-understood by most stakeholders.
105. Given the materiality of the potential stranding issue faced by the GPBs, we think it would be appropriate for the Commission to address the potential mitigation measures prior to the DPP3 review, rather than deferring consideration of those important matters until the next IMs review (which would not be concluded before the DPP3 reset is finalised). Deferring consideration of these issues until the next IMs review would result in the existing IMs (which were developed at a time when GPBs faced much lower economic network stranding risk than they presently do) being applied to set GPBs' prices for the next five years, as though no increase in economic network stranding risk had occurred.
106. **Figure 4** in section 3.2 showed that under the Commission's real returns framework—and assuming that GPBs invest only in reliability and safety capital expenditure to 2031—there could be over \$1.2 billion in unrecovered GPB RAB value by 2050. We also showed that the value of the RAB that could be stranded in 2050 could be reduced to \$710 million by switching to a nominal returns framework now.
107. If, however, the Commission were to delay switching to a nominal returns framework until 2027 (i.e., DPP4), then the RAB value that would be stranded in 2050 would increase by approximately \$65 million. Indeed, the longer the Commission defers a decision to adopt a nominal returns framework, the greater would be the RAB value stranded in 2050 (all else remaining equal).
108. In a recent regulatory decision for the Dampier to Bunbury Pipeline (**DBP**) in Western Australia, the Economic Regulatory Authority of Western Australia (**ERA**) decided to shorten the assumed asset life of the pipeline such that the assets would be depreciated fully by 2063 (rather than between 2077 and 2081). In doing so, the ERA recognised that recent changes to the State Government's climate change policies, and ongoing technological change in the industry, had resulted in an increase in the stranding risk faced by DBP.
109. When reaching its decision to shorten the asset life assumption for DBP's pipeline assets, the ERA recognised that there can be considerable uncertainty over the economic life of long-lived assets. However, the ERA explained that regulators should not wait until they have certainty before taking action to address stranding risk:³³

³² Clause 2.2.9 of the Gas Distribution Service Input Methodologies determination (3 April 2018) and clause 2.2.9 of the Gas Transmission Service Input Methodologies determination (3 April 2018) requires that the RAB be revalued in each disclosure year using outturn CPI inflation.

³³ ERA, Final decision on proposed revisions to the Dampier to Bunbury Natural Gas Pipeline access arrangement 2021 to 2025, 1 April 2021, para. 1512.



The ERA notes that any view on the economic life of an asset, particularly one with a possibly long technical life, implies a forecast and a level of uncertainty. Uncertainty does not prohibit the possibility of a change in economic life, nor does uncertainty remove the need to update forecasts to reflect the best available information. The standard of evidence for changing the outlook is not certainty.

110. We agree with the ERA, and consider that a similar principle applies in the Commission's case. In particular, we consider that the Commission should act as early as possible—having recognised that the stranding risk faced by GPBs has increased since 2016—in view of the fact that:
 - a. The value of the GPB RABs that could be stranded is very material; and
 - b. Delaying action would exacerbate the stranding losses.



A Method for determining remaining asset lives for existing assets

111. Section 3.2 presented indicative analysis on the value of the total GPB RAB that could become stranded if the Commission in 2050 under the existing real returns framework, and the stranded value that could be avoided if the Commission were to adopt a nominal returns framework going forward. That analysis was performed by rolling forward the existing RAB to 2050.
112. One input required to perform this calculation is an estimate of the remaining assets life for existing assets in each asset class.
113. A complicating factor is that within each asset class reported by the GPBs in the Information Disclosures are assets of different types and vintages, that are at various stages of being depreciated. This means that there may be a range of remaining asset lives within each asset class, rather than a single remaining asset life for each asset class. Hence, using a single remaining asset life assumption for each asset class would likely provide misleading projections of the rolled-forward RABs.
114. We did not have access to granular data on remaining asset lives for each subclass of asset required to roll forward the RAB accurately. In lieu of that information, we adopted the following approach to determine the remaining asset lives for existing assets in 2021:
 - a. Step 1: we obtained the following information for each asset class (and for each GPB) in 2020 from the Information Disclosures:
 - i. Weighted average remaining life (WARAL);
 - ii. Weighted average expected total asset life (WAETAL);
 - iii. Opening RAB; and
 - iv. Depreciation.
 - b. Step 2: We assumed that are only two types of asset within each asset class:
 - i. Type 1: Assets with a high remaining asset life; and
 - ii. Type 2: Assets with a low remaining asset life.
 - c. Step 3. We assumed that the remaining asset life of Type 1 assets is the average between WARAL and WAETAL.
 - d. Step 4. We solved for:
 - i. The remaining asset life of Type 2 assets; and
 - ii. The share of Type 2 assets within each class,that matches the assumed remaining asset life for Type 1 assets (Step 3) and the amount of depreciation disclosed for 2020.
115. We then used the assumed/computed remaining asset lives for Type 1 and Type 2 assets, for each asset class, to roll forward the RAB for each GPB.
116. We confirmed with the gas businesses that the resulting rolled-forward RAB values were broadly consistent with the rolled-forward RAB values produced by their own, more detailed and accurate calculations.



B Simple numerical example



Table 1: NPV of total allowed returns under nominal and real return frameworks – no stranding risk

NPV	1	2	3	4	5	6	7	8	9	10
Nominal returns framework										
Opening RAB	\$100.0	\$90.0	\$80.0	\$70.0	\$60.0	\$50.0	\$40.0	\$30.0	\$20.0	\$10.0
Indexation	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Real depreciation	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0
Nominal depreciation	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0
Closing RAB	\$90.0	\$80.0	\$70.0	\$60.0	\$50.0	\$40.0	\$30.0	\$20.0	\$10.0	\$0.0
Return on capital	\$5.0	\$4.5	\$4.0	\$3.5	\$3.0	\$2.5	\$2.0	\$1.5	\$1.0	\$0.5
Return of capital	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0
Total return	\$100.00	\$15.0	\$14.5	\$14.0	\$13.5	\$13.0	\$12.5	\$12.0	\$11.5	\$11.0
Real returns framework										
Opening RAB	\$100.0	\$91.8	\$83.2	\$74.3	\$64.9	\$55.2	\$45.0	\$34.5	\$23.4	\$12.0
Indexation	\$2.0	\$1.8	\$1.7	\$1.5	\$1.3	\$1.1	\$0.9	\$0.7	\$0.5	\$0.2
Real depreciation	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0
Nominal depreciation	\$10.2	\$10.4	\$10.6	\$10.8	\$11.0	\$11.3	\$11.5	\$11.7	\$12.0	\$12.2
Closing RAB	\$91.8	\$83.2	\$74.3	\$64.9	\$55.2	\$45.0	\$34.5	\$23.4	\$12.0	\$0.0
Return on capital	\$3.0	\$2.8	\$2.5	\$2.2	\$1.9	\$1.7	\$1.4	\$1.0	\$0.7	\$0.4
Return of capital	\$10.2	\$10.4	\$10.6	\$10.8	\$11.0	\$11.3	\$11.5	\$11.7	\$12.0	\$12.2
Total return	\$100.00	\$13.2	\$13.2	\$13.1	\$13.1	\$13.0	\$12.9	\$12.8	\$12.8	\$12.7



Table 2: NPV of total allowed returns under nominal and real return frameworks – 50% probability of stranding risk after Year 5

	NPV	1	2	3	4	5	6	7	8	9	10
Nominal returns framework											
Opening RAB		\$100.0	\$90.0	\$80.0	\$70.0	\$60.0	\$50.0	\$40.0	\$30.0	\$20.0	\$10.0
Indexation		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Real depreciation		\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0
Nominal depreciation		\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0
Closing RAB		\$90.0	\$80.0	\$70.0	\$60.0	\$50.0	\$40.0	\$30.0	\$20.0	\$10.0	\$0.0
Return on capital		\$5.0	\$4.5	\$4.0	\$3.5	\$3.0	\$1.3	\$1.0	\$0.8	\$0.5	\$0.3
Return of capital		\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$5.0	\$5.0	\$5.0	\$5.0	\$5.0
Total return	\$80.41	\$15.0	\$14.5	\$14.0	\$13.5	\$13.0	\$6.3	\$6.0	\$5.8	\$5.5	\$5.3
Real returns framework											
Opening RAB		\$100.0	\$91.8	\$83.2	\$74.3	\$64.9	\$55.2	\$45.0	\$34.5	\$23.4	\$12.0
Indexation		\$2.0	\$1.8	\$1.7	\$1.5	\$1.3	\$1.1	\$0.9	\$0.7	\$0.5	\$0.2
Real depreciation		\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0
Nominal depreciation		\$10.2	\$10.4	\$10.6	\$10.8	\$11.0	\$11.3	\$11.5	\$11.7	\$12.0	\$12.2
Closing RAB		\$91.8	\$83.2	\$74.3	\$64.9	\$55.2	\$45.0	\$34.5	\$23.4	\$12.0	\$0.0
Return on capital		\$3.0	\$2.8	\$2.5	\$2.2	\$1.9	\$0.8	\$0.7	\$0.5	\$0.4	\$0.2
Return of capital		\$10.2	\$10.4	\$10.6	\$10.8	\$11.0	\$5.6	\$5.7	\$5.9	\$6.0	\$6.1
Total return	\$78.37	\$13.2	\$13.2	\$13.1	\$13.1	\$13.0	\$6.5	\$6.4	\$6.4	\$6.3	\$6.3



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