Letter to the Ministry of Business, Innovation and Employment

2 November 2023

To:

Energy Resources Markets Branch

Ministry of Business, Innovation and Employment

Wellington

From:

Kia ora team

Attention: Gas Transition Plan submissions

This is a joint submission made by the major gas pipeline businesses (GPBs), Firstgas, Powerco and Vector, on the *Gas Transition Plan Issues Paper* (the Issues Paper) developed by the Ministry of Business, Innovation and Employment (MBIE) in conjunction with the Gas Industry Company Limited (GIC) and published on 9 August 2023.

We acknowledge the opportunities we have been provided to contribute to MBIE's and GIC's work to date and welcome the further opportunity to comment on certain key issues of common interest that have emerged from our recent work. This is not a comprehensive submission and supplements submissions each business has or will provide separately.

The submission draws on the following recent Gas Infrastructure Future Working Group (Working Group) projects that provides more detailed insight on the future of gas infrastructure in Aotearoa New Zealand:

- **Gas Transition Analysis Paper** | This paper reports on modelling work commenced in November 2022 to assess four gas transition scenarios advised by the GIC. It uses a conceptual financial model previously developed by the Working Group with updated inputs to analyse potential impacts on gas consumers, GPBs and Government of alternative gas futures. The model and inputs to it were updated to incorporate more recent information and to consider the gas transition scenarios over the period out to 2050.

  Two headline numbers from this analysis are an estimated $7.9 billion cost to consumers in conversion costs, and a potential cost recovery risk faced by GPBs of $973 million from unrecovered revenue and stranded assets *if* the pipelines are wound down by 2050. The analysis also illustrates the potential for those businesses to face negative cash flows in in that scenario (see further discussion in Attachment A).

- **Gas Network Rightsizing Progress Report** | This paper looks at how future decisions could be made to decommission segments of existing gas infrastructure where it is

sensible to do so. It has also considered how consumer demand could be transferred from reticulated gas to other energy systems – such as LPG supply or electricity network supply – in the short to medium term. The study has been pursued as a desktop exercise focused on research and discussion with collaboration to this point among the GPBs.

- **Gas Network Optionality Framework** | The Working Group is currently developing a framework that applies real options thinking[1] to key questions facing gas pipeline infrastructure in Aotearoa New Zealand. Although ongoing and starting from a conceptual point of view, the work is providing some highly useful insights that we consider MBIE and GIC can benefit from when developing the Gas Transition Plan. We discuss this further below.

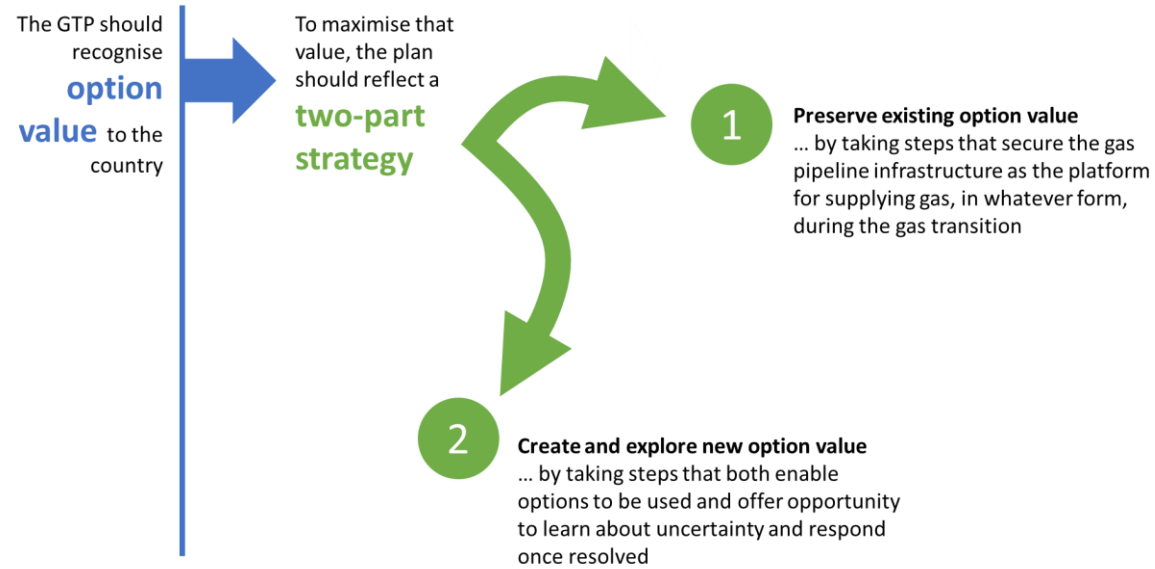
MBIE and GIC staff along with other stakeholders have been involved with these work streams as observers to the Working Group. Outputs from the first two projects are attached along with earlier outputs prepared by the Working Group listed in Attachment C. We will provide the outputs from the third project – on real options analysis – once ready.

We have options

Our more recent work has highlighted that, when it comes to decarbonizing gas supply, Aotearoa New Zealand has a range of options and these are valuable to the country *even if* they are taken up in the future once more information is known.[2] When developing the Gas Transition Plan it will be important to recognise this value before making irreversible policy and other decisions.

To make the most out of this potential option value, we strongly encourage MBIE and GIC to consider a two-part strategy (summarised in Figure 1) that seeks to maximise this value for the benefit of the country and energy consumers specifically.

Figure 1: Two-part strategy



[1] In short, a 'real option' is the right by not the obligation for someone to do something real that is valuable, such as build a factory. It contrasts to a 'financial option', which is focused on financial assets. Real options thinking, therefore, considers how the right to do something (or more than one thing) in the future is valuable even if one has not decided to exercise do it yet.

[2] We use 'value' here in a broad sense, going beyond pure financial value to include outcomes such as reliability, security and quality of energy supply and environmental impacts, *from a societal (i.e., whole of country) perspective.*

The strategy involves:

1. **Preserving *existing* option value** | by undertake steps that secure the gas pipeline infrastructure as the platform for supplying gas, in whatever form, during the gas transition.

   The reality is that even if natural gas is phased out and that infrastructure is eventually wound down, this will take time and the infrastructure will need to remain operational for quite some time to ensure that energy consumers – and the country – are not unnecessarily harmed (e.g., by having that infrastructure shut down sooner than is socially desirable). But there is also real option value that the country could benefit from, such as repurposing that infrastructure to transport renewable gases like biomethane.

   Moreover, a well-managed and planned transition will also help to protect the electricity system (both generation and networks) from unmanageably rapid increases in demand before the system is equipped to deal with them. Securing the gas pipeline infrastructure will help protect against uncertainties in other parts of the energy system, such as future electricity costs and investment needs, and the economic and technical feasibility of biomass for transport and industrial energy decarbonisation.

2. **Creating and exploring *new* option value** | by actively exploring the potential to re-purpose gas pipelines to transport renewable gases or to take advantage of opportunities for carbon capture and sequestration.

   When done well, this will give Aotearoa New Zealand the best chance of realising value from those gases and the existing infrastructure. It would be a real shame for the country if decisions were made prematurely that effectively destroy that option value, or opportunities were missed that put our energy supply system in a worse position for generations to come.

The next two sections elaborate on this strategy and why MBIE should consider adopting it, or a similar framework, when developing the Gas Transition Plan.

Steps to preserve value *for the country*

The **first part** of the proposed strategy is key to preserving option value. In our view, gas pipeline infrastructure should be seen as 'a critical enabler' of a well-managed transition away from fossil gas while maintaining Aotearoa New Zealand's energy security. As noted within Issue 1 discussed in Attachment A, this is entirely consistent with the objectives set out in the Issues Paper.

Preserving pipelines as a critical enabler of a well-managed transition will require Government to **signal an intent** to support financial capital maintenance of that infrastructure and the regulatory compact that underpins it, which could involve:

- Amending the Commerce Act to require the Commerce Commission to factor in climate change outcomes and objectives when making regulatory decisions, similar to recent changes made to the legislative frameworks in Australia and the UK.[3]

- Issuing one or more Government Policy Statements that encourage or require the Commerce Commission to implement options-preserving, no-regrets financial mechanisms that promote

[3] Australian Department of Climate Change, Energy, the Environment and Water, *Incorporating an emissions reduction objective into the national energy objectives*, 6 June 2023. See: https://www.energy.gov.au/government-priorities/australias-energy-strategies-and-frameworks/national-energy-transformation-partnership/incorporating-emissions-reduction-objective-national-energy-objectives#:~:text=On%2019%20May%202023%2C%20Energy,the%20national%20energy%20objectives)%20respectively.

financial capital maintenance and mitigate negative impacts on gas consumers. An example of this is tilted accelerated depreciation, but that is only one such mechanism available. While this is currently an option open to the Commerce Commission, it is not guaranteed over the longer term.

- Clarifying who is responsible for pipeline decommissioning costs if they are removed from service; and, if it is the GPBs, then implement policy that allows for these costs to be fairly recovered from gas consumers while demand is high enough (e.g., by provisioning for an end-of-life fund).

- Supporting network rightsizing strategies that the GPBs are exploring and which can help reduce potential asset stranding risk.

For the most part, these steps are intended to give confidence to those that need to invest in gas infrastructure to keep it operational during the transition, and potentially beyond. The importance of maintaining confidence among regulated infrastructure investors becomes even more critical given the quantum of investment needed in electricity and water infrastructure. Actions (or inactions) that jeopardise financial capital maintenance for GPBs risks a contagion of under-confidence spreading across the wider investment and financing community in Aotearoa New Zealand.

Our boards and management teams are increasingly facing questions over whether there is an opportunity for us to recover our efficient costs given the long (50+ year) timeframes that are allowed for within the regulatory framework. It is conceivable that, without some positive steps by Government, GPBs will need to cut back investment in a way that is rational for them but sub-optimal for Aotearoa New Zealand, at least while uncertainty remains high.

This creates a material risk to a well-managed transition. While pipeline owners can plan for an element of right-sizing, and a planned wind-down, unplanned asset failures are an unavoidable feature of infrastructure. We discuss this concern further within Issue 2 in Attachment A.

Preserving gas pipeline infrastructure as critical enabler of a well-managed transition over the longer term may require **more progressive steps** to help promote financial capital maintenance that should be explored further, such as:

- Government actively supporting (e.g., guaranteeing) recovery of allowed revenues determined by the Commerce Commission, whereby in the event that GPBs are unable to recover that revenue, government will step in to the pay the difference between what is recovered and what is allowed.

- Government securitizing some or a portion of the gas pipelines through government-backed bonds as a way to reduce cost impacts for gas consumers given the social good from decarbonization, similar to that applied in other jurisdictions such as California.

- Government re-nationalising some or all of the gas pipelines as a way to both help manage gas consumer bill impacts and to improve coordination and alignment of incentives.

A further component of this strategy is looking at ways to reduce the future carbon footprint of existing gas consumption. Government could pursue this by supporting the largest gas consumers to decarbonise their operations and by supporting the uptake of carbon capture and storage technology (e.g., by recognizing CCuS in the Emissions Trading Scheme).

Steps to create value *for the country*

The **second part** of the strategy is all about seeking to create or maximise option value from renewable gases in terms of reliability, affordability, and security of supply, and choice for energy consumers.

Exploring this potential will involve '**enablement steps**' that enable renewable gases to be developed and injected into existing gas pipelines. Potential steps include:

- Establishing or backing a renewable gas certificate scheme that allow suppliers and buyers to trade renewable gases and signals government support for renewable gases through the gas transition.

- Amending New Zealand's Emissions Trading Scheme or providing other financial support for renewable gas projects in much the same way that other decarbonisation projects are supported.

- Amending the Gas Act to ensure that the definition of gas is broad enough to cover renewable gases, such as biomethane and hydrogen, so that the Commerce Commission can consider the supply of those gases when making its regulatory determinations (i.e., under Part 4 of the Commerce Act).

- Updating gas technical standards to cover those gases, ensuring that there is a pathway for the safe production, transportation, and consumption of those gases via New Zealand's gas supply chain.

It will also involve '**learning steps**' that seek to discover whether and how renewables gases could have a genuine future in New Zealand, including by:

- Conducting consumer research into the likely uptake of renewable gases across consumer cohorts.

- Undertaking whole of system modelling to better understand the broader impact of alternative futures across New Zealand's energy supply, including as to reliability, affordability, and security of supply and recognizing the linkages with electricity generation/flexibility, supply side dynamics, potential for imported energy, and large existing gas consumers such as Methanex.

- Directly funding or otherwise supporting renewable gas trials or other research and development, with requirements for these to publicly report back learnings.

Collectively, enablement and learning steps are critical to tapping into the potential value to Aotearoa New Zealand from using existing gas pipeline infrastructure to transport renewable gases.

Pursuing option value is *not* a cop-out

One criticism of our proposed two-part strategy could be that it effectively defers any real decisions as to the future of gas, potentially increasing the cost if decisions are eventually made to wind down gas pipeline infrastructure. To address this, we would encourage Government to articulate a set of future decision points or guiderails that allow for learnings from part two of our strategy to be factored in. This could involve, for instance, setting a minimum level for renewable gas injection to the pipelines which if not achieved by a certain date could trigger a re-think about the future of gas.

If, after undertaking enabling and learning steps it becomes clearer that renewable gases are not the way forward, then further effort can be put into finding the most cost-effective way to winddown gas pipelines with the least harm to gas consumers. Determining at what point such a decision can be made will depend on trading off potential option value from further learning against the potential cost of deferring the decision further – something that Government should actively turn its mind to.

We would also encourage Government to consider steps that improve coordination between energy and climate policy across policy makers and regulators.

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Once again, we welcome the opportunity to engage with MBIE and GIC on its Issues Paper. We also appreciate the continued involvement of MBIE and GIC staff with the Working Group as we look to foster a constructive dialogue on what are undoubtably tricky policy decisions facing the gas sector over the coming years.

Attachment A steps through 4 key issues explored by the Working Group that appear directly relevant to the Issues Paper. **Attachment B** responds to specific questions raised in the Issues Paper. **Attachment C** lists Working Group outputs that we have included with this submission.

Please let us know if you have any questions about the points raised above or in the attached supporting documents. This submission does not include any confidential information.

Ngā mihi nui,

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Attachment A | Key issues explored by the Gas Infrastructure Future Working Group

The attachment focuses on the following four key issues raised in the Issues Paper.

- Issue 1: Energy transition objectives
- Issue 2: Technical or economic sustainability of gas networks
- Issue 3: Affordability risks for consumers
- Issue 4: Gas network optionality.

Issue 1: Energy transition objectives

The Issues Paper (page 13) sets out the following objectives for the transition of the energy and industry sectors over the next 30 years:

- energy remains accessible and affordable to support the wellbeing of all New Zealanders
- energy supply is secure, resilient and reliable throughout the transition and beyond, and
- energy systems support economic development and productivity growth aligned with the transition.

The Issues Paper (page 7) further notes that Aotearoa New Zealand's climate change goals will require a managed transition from fossil gas use over the coming years. It outlines issues relevant to such a transition. The paper articulates that a key objective for the gas sector transition is:

> *Maintaining energy security while demand for gas continues to decline.*

The Issues Paper (page 7) elaborates that:

> *Ensuring supply continues to meet our energy needs as demand declines will require ongoing investment in fossil gas production, distribution, and transmission assets.*

The Working Group has made similar observations in its outputs, including in its *Findings Report* (page 19):

> *it will be necessary to make efficient ongoing investments in the gas networks, even if there is a winddown. These investments could consist of investments in asset replacements, new connections or system growth to provide gas to consumers who will benefit from the use of gas during the transition. These investments will certainly also involve expenditure to maintain the reliability and safety of existing systems.*

Importantly – as discussed below – analysis by the Working Group suggests that there is a real risk that GPBs will not be economically sustainable if wound down by 2050, unless there is some intervention by Government. Such a risk would likely undermine the ability of those businesses to make the investment needed to keep the networks operational throughout the transition, highlighting why it is important for the Gas Transition Plan to be designed in a way that manages these risks.

While pipeline owners can plan for an element of right-sizing – and a planned wind-down – unplanned asset failures are an unavoidable feature of infrastructure. Such failures could force owners to make much larger stay-in business decisions than planned and sooner, which could undermine a managed transition by undermining the economic sustainability of GPBs.

From a gas infrastructure perspective, we consider that the Gas Transition Plan should include a specific operational objective along the following lines:

> *Gas pipeline businesses should have the opportunity to recover their efficient operating and capital costs that need to be incurred during the energy transition to support secure, reliable and safe gas infrastructure services while these continue to be provided.*

Government policy and the resulting statutory frameworks for the gas sector were developed in the context of a steady state industry, not for a gas sector that will undergo a managed transition. Objectives and principles underpinning those frameworks will likely need to change support such a transition so that they can better guide relevant decision makers, such as the Commerce Commission.

By way of example, the Australian state and federal governments recently agreed to amend the national objectives applying to the economic regulation of gas and electricity sectors to incorporate an emissions reduction objective.[4] The Australian Energy Regulator (AER) has indicated that giving effect to these changes will likely involve quantifying emissions reductions and their value when making decisions, factoring this into expenditure assessments, cost benefit analysis, and valuing consumer energy resources.[5] Adding a new emissions reduction objective will directly affect future AER decisions for gas networks.

Issue 2: Technical or economic sustainability of gas networks

The Working Group has explored economic sustainability of gas networks in some detail.

The Issues Paper (page 25) notes:

> *Gas networks face risks regarding sections of the network becoming uneconomic to run as users disconnect. As demand declines, the fixed costs of maintaining the pipeline network will be shared between fewer consumers, creating the risk of gas becoming increasingly expensive for consumers and driving accelerating network disconnection. If the number of users drops below a critical level, it could create issues in maintaining minimum pressures and increasingly prohibitive costs for the remaining gas network users. We expect that economic issues will arise first. Understanding when that is and options for managing the transition for customers is crucial.*

Modelling work undertaken by the Working Group last year and earlier this year highlights how the economic sustainability of gas networks is called into question if the gas networks are wound down without some form of Government mitigating actions.[6] As suggested in the Issues Paper, this arises because as consumers defect from the gas network the largely fixed costs of continuing to maintain and operate the network are spread over fewer and fewer remaining gas consumers.

The Working Group analysis indicates that parts of the networks could start to become economically unsustainable within the next decade in certain circumstances. This is perhaps best illustrated by Figure 2, which shows how net cash flows to gas pipeline businesses could become negative by about 2040 if the pipelines are on a pathway to shut down by 2050 *without any Government mitigation*.

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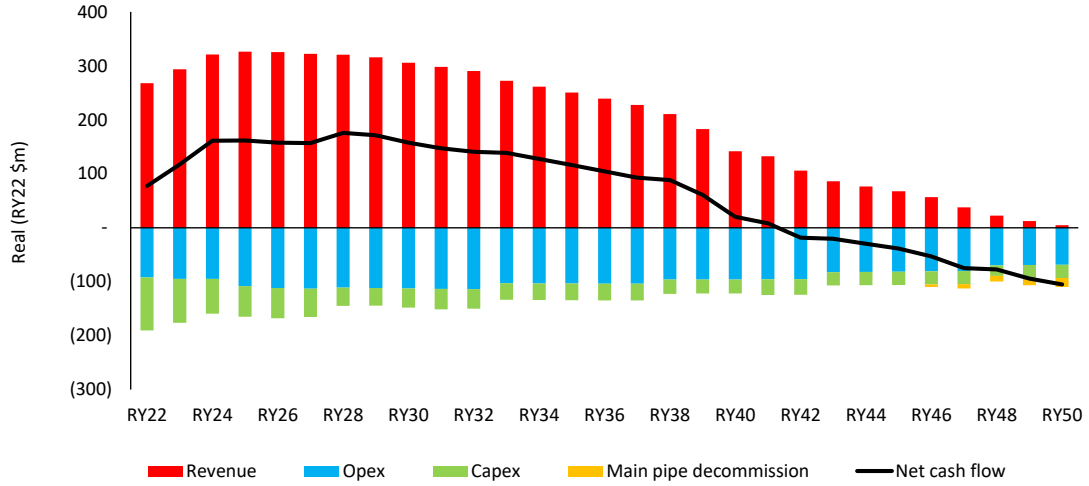
[4] See: Commonwealth Government of Australia information page: https://www.energy.gov.au/government-priorities/energy-and-climate-change-ministerial-council/working-groups/national-energy-transformation-partnership/incorporating-emissions-reduction-objective-national-energy-objectives.

[5] See: Australian Energy Regulator, *AER guidance on amended National Energy Objectives: Draft guidance for consultation*, July 2023.

[6] See: GIFWG, *Initial Analysis Paper*, March 2022; GIFWG, *Further Analysis Paper*, March 2022; and GIFWG, *Gas Transition Analysis Paper*, June 2023.

Figure 2: Cash flows to all gas pipeline businesses [Repeat of Figure 4.9 of the Gas Transition Analysis Paper]



The *Gas Transition Analysis Paper* (page 4) observed:

> *Faced with that outlook it may be rational for gas pipeline businesses to shutdown uneconomic sections of their infrastructure sooner than is socially desirable. If shutdown did occur, then energy consumers would lose the option to choose reticulated gas as an energy source.*

Recognising this risk, and the potential consequences for gas consumers, the Working Group also explored potential solutions. For instance, the *Solutions Scoping Paper* explores steps that Government, regulators, or GPBs could take, ranging from actions that promote demand for green gases and inform consumers about decisions (e.g., when replacing appliances) to actions that maintain the viability of GPBs through the energy transition (e.g., compensation for asset stranding caused by Government action).

The *Solutions Scoping Paper* suggests that prioritising potential solutions is a key next step, identifying several initial insights, including:

- a threshold question is whether and when New Zealand should pursue repurposing of gas infrastructure or not
- some potential solutions are already being considered and others may be under consideration
- maintaining incentives for necessary investment in the short term in an uncertain future is a priority
- some solution options are 'no regrets/ low regrets' decisions; solutions packages should be coherent, and
- there may be package of solutions that could form the elements of a 'bargain' between the Government and the GPBs

Building on that earlier work, the Working Group remains focused on exploring certain potential solutions in more detail. For instance, the recently completed *Network Rightsizing Progress Report* summarises outcomes from a desktop study that explores how the gas networks could shutdown uneconomic parts of their networks as one strategy to improve economic sustainability in the short to medium term and support productive efficiency (e.g., efficiently avoid upcoming investment costs).

The Working Group considered that such a strategy should largely be considered a 'no regrets' activity – given that it is sensible for GPBs to pursue the strategy even if networks are expected to remain operational in the longer term, *assuming* that any barriers can be overcome. To that end,

the study highlights potential barriers to such a strategy and the potential consequences for consumers (e.g., conversion costs), identifying potential roles for Government.

The Issues Paper includes several questions related to the technical or economic sustainability of gas networks. Attachment 1 responds to some of these.

Issue 3: Affordability risks for consumers

Ultimately the community – either as consumers or taxpayers – will need to meet the costs of the energy transition. Assessing when affordability becomes a concern and how costs are spread raises social equity questions for the community and the Government. GPBs also have an indirect interest in consumer affordability given that increased retail gas prices could increase credit risk for gas retailers especially for vulnerable consumers and may reduce future gas demand.

The Issues Paper (page 26) notes:

> *Commercial and residential users represent the smallest proportion of the market in terms of fossil gas volume, however, they represent the majority of fossil gas and LPG pipeline connections. Many residential consumers also face high switching costs that could be difficult for them to meet, or they are unable to switch if they are renting. There is a risk if consumers rapidly switch away from fossil gas that this consumer segment, particularly low-income users and renters, will be burdened with a rapidly increasing share of pipeline costs. These vulnerable users may need to be supported.*

Recent analysis by the Working Group reinforces these observations. For instance, the *Gas Transition Analysis* paper (page 3) observes that:

> *A winddown of gas pipelines exposes the remaining gas consumers to substantial price increases as other consumers defect up until the infrastructure is shutdown. After that point, consumers lose the choice to consume reticulated gas to meet their energy needs and are required to invest in alternative appliances.*
>
> *The Working Group's earlier analysis showed that the pace of the winddown will clearly affect that risk – with a faster winddown leading to faster price increases that will encourage more rapid defection of consumers through the winddown.*

That analysis – as well as earlier analysis by the Working Group[7] – suggests that prices could more than double by 2040 even if inflation is ignored. That is significant, especially for those unable to switch to alternative energy sources fast enough.

The *Gas Transition Analysis Paper* (page 3) also noted that:

> *As well as price increases, winddown of gas pipelines will lead to significant conversion costs being incurred by gas consumers. Initial estimates suggest that across all consumers this could be $7.9 billion if full winddown occurs by 2050 or $7.3 billion if conversion to LPG occurs by 2040.*

These estimates are relatively high level and are projected well into the future; they could change as estimates improve and cost elements change over time.

Conscious that consumers are not all the same – and so will be affected in different ways by price increases and conversion costs – the Working Group explored vulnerability among gas consumers

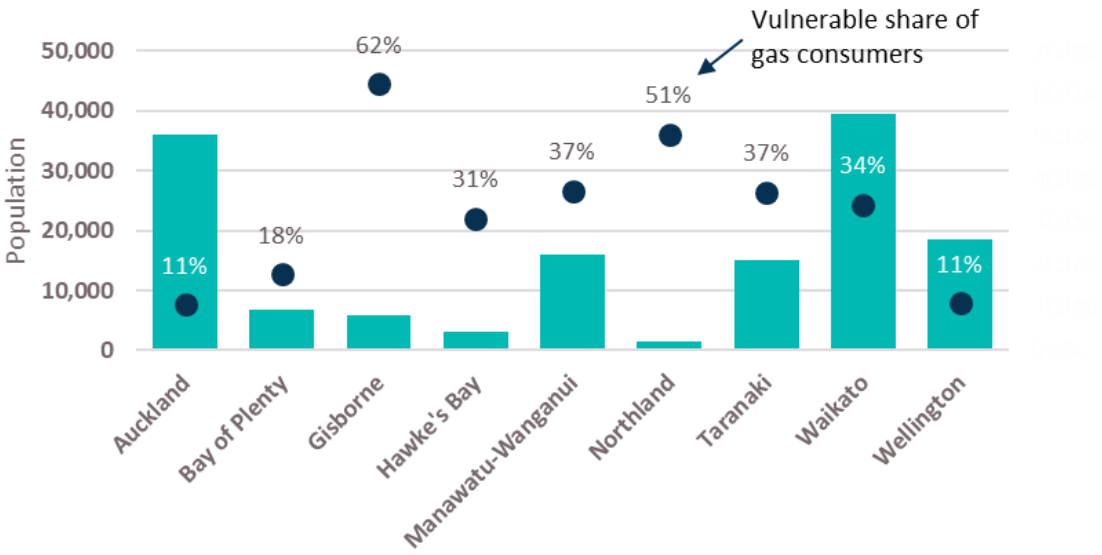
[7] See: GIFWG, *Initial Analysis Paper*, March 2022; and GIFWG, *Further Analysis Paper*, March 2022.

(deprivation index 8–10).[8] For instance, analysis presented in the *Findings Report* (page 8) indicated that:

> *there are over 140,000 residential gas consumers (roughly 19%) relying on the gas pipelines that may be considered vulnerable, with these consumers distributed across North Island regions.*

Figure 2.1 of that report (repeated below) identifies the share of consumers, by region, that could be considered vulnerable.

Figure 3: Distribution of vulnerable gas consumers by region [Repeat of Figure 2.1 of the Findings Report]



The Working Group is has considered how vulnerable gas consumers may be disproportionately affected by affordability risks that result from the gas transition. As a starting point, the Working Group's *Solutions Scoping Paper* considered several potential solutions to address affordability risks, including:

- steps to ensure consumers are well informed about information relevant to their switching decisions
- appliance conversion cost financing or subsidies
- consumer pricing solutions or steps to spread costs differently (e.g., to consumers that switch earlier).

The Working Group's study into network rightsizing – including by looking into the experience in Western Australia – suggests that well-planned switching processes have the potential to help minimise switching costs.

Many of those potential solutions imply a role for Government. They may also have a significant fiscal impact. For instance, the Working Group heard from Horizon Power about the costs involved in transitioning gas consumers in the country town of Esperance in Western Australia to alternative

[8] In the *Findings Report* analysis, vulnerability was assessed as being gas consumers that fall within deciles 8–10 of the Environmental Health Intelligence Agency's deprivation index. 'Gas consumers' are estimated by converting gas connections into population numbers using Census data. The deprivation index measures financial and non-financial indicators of deprivation, including employment status, living situation, and access to internet.

energy sources. The Western Australian Government committed AU$10.5 million to transition around 400 gas consumers (i.e., AU$26,250 per consumer).[9]

The Commerce Commission presently has discretion to make decisions to accelerate depreciation to bring forward gas pipeline cost recovery. This is a useful tool that can contribute to equitable cost recovery where – in the shorter term at least – many consumers remain connected to the gas networks, including those consumers that are better off financially. The Government should not unnecessarily limit the Commerce Commission's ability to make decisions to accelerate depreciation. To promote financial capital maintenance, it may be necessary for the Government to actively encourage or require the Commission to apply such mechanisms.

The Issues Paper includes several questions related to the affordability risks for gas consumers. Attachment A responds to some of these.

Issue 4: Gas network optionality

The Issues Paper notes that existing gas infrastructure could be used to transport alternatives to fossil gas.

For instance, in relation to hydrogen the Issues Paper (page 34) it notes:

> *The potential use cases for hydrogen as they relate to New Zealand's existing gas system include:*
>
> - *Blending hydrogen in the existing gas network alongside fossil gas and biogas.*
> - *Repurposing existing gas infrastructure, skills, and supply chains to carry 100 per cent hydrogen, as a replacement for existing gas uses like industrial feedstock, industrial process heat, residential and commercial heat and electricity peaking generation, as well as distribution to support new use cases like vehicle refuelling.*

Similarly, on biogas, the Issues Paper (page 32) notes:

> *Biogas blending in distribution pipelines could be viewed as an interim measure which would provide more choices for consumers and could facilitate the development of a biogas market in the short term out to 2035.*

Earlier analysis by the Working Group considered how gas networks could be repurposed to transport green gases such as biomethane or hydrogen. The *Findings Report* (page 1) noted that:

> *There is significant interest in the potential for zero-carbon gasses – hydrogen and bio methane produced from biogas – to play a role in New Zealand's energy transition | as part of this, there is interest in the potential role for repurposing gas pipelines, which would underpin, and require, a larger scale zero-carbon gas industry in New Zealand. Global interest in these gasses is also significant.*

Modelling undertaken by the Working Group suggests that blending biomethane or hydrogen could help mitigate potential price rises. For instance, the *Gas Transition Analysis Paper* (page) notes:

> *Blending biomethane may help reduce that price risk to gas consumers, although further work is needed to better understand what demand may look like under such a scenario.*

More broadly, the Working Group has also considered how optionality is relevant to decisions about the future of gas networks in Aotearoa New Zealand. A current workstream involves

[9] See: Western Australian Government press release: https://www.wa.gov.au/government/media-statements/McGowan-Labor-Government/Esperance-electrification-project-an-energy-transition-first-20230331.

exploring how a real options framework could be used to inform those decisions by factoring in options to:

- repurpose the networks to transport green gases
- use the networks to supply energy when other energy supply chains, such as electricity networks, are unable to (e.g., due to cyclone events)
- supply gas to consumers that may prefer gas, whether green or otherwise, to alternatives such as electricity.

Although these options may have value from a GPB or individual consumer perspective, this workstream has focused on how these and other options may be relevant from a social (i.e., NZ Inc) perspective.

A key insight from this ongoing work is that there is value *to the country* in exploring whether existing gas pipeline infrastructure can support security of supply and other outcomes through the gas transition. Our proposed two-part strategy discussed above was born out of this thinking.

Some solutions identified in the *Options Scoping Paper* could help increase option value by improving the economics of pursuing green gases or removing information asymmetries (e.g., subsidies, direct procurement, or mandates). At the same time, strategies like network rightsizing – explored further in the *Network Rightsizing Progress Report* – could also improve option value by reducing the costs of waiting to make decisions about the future of gas networks. A more efficiently sized network will help reduce the ongoing holding (i.e., maintenance) costs of the network, without materially compromising its ability to support delivery of green gases in future.

The Issues Paper includes several questions related to the optionality. Attachment B responds to some of these.

Attachment B | Responses to specific consultation questions

This attachment provides responses to questions raised in the Issues Paper. These are identified by issue identified above.

Issue 2: Technical or economic sustainability of gas networks

Consultation question	Response
How can New Zealand transition to a smaller gas market over time?	The New Zealand Emissions Trading Scheme (ETS) is the Government's main tool for reducing greenhouse gas emissions. Progressive reduction in the number of emissions units supplied into the scheme over time, in line with Aotearoa New Zealand's emission reduction targets, is expected to provide a price signal to business and consumers. Consequentially, relative prices will increasingly favour renewable energy sources – including electricity and green gasses – relative to fossil gas, which is expected to progressively decline. Given these changes, it is decisions made by gas consumers and by gas supply chain participants in response that are likely be *the* key underlying driver that leads to a smaller gas market in the future. However, leaving the transition to the market forces is very unlikely to produce acceptable outcomes in line with the gas transition objectives because of the following risks: 1. **GPBs become financially unsustainable** | Gas supply security, reliability and safety objectives will increasingly be at risk – potentially within the next decade – where GPBs become financially unsustainable as gas demand falls. This may promote Boards of those businesses to cut back investment in so as to satisfy their duty to act in the interests of shareholders. 2. **Poor management of consumer impacts from gas network rightsizing** | Minimising disruption to consumers where right-sizing gas networks occurs on a significant scale and managing consumers switching to other energy sources will likely benefit some form of Government oversight. There also remains the ever-present risk that unplanned asset failures require some right-sizing (e.g., as it is uneconomic to reinstate assets) that is sub-optimal. 3. **Affordability risks** | Consumer affordability may be challenged, firstly, as demand declines and fixed costs need to be shared between fewer consumers; and secondly where there are unacceptably high costs for some consumers of transitioning to alternative energy sources. 4. **Efficiency losses in the use of resources** | GPBs could prematurely shutdown uneconomic sections of their infrastructure sooner than is socially desirable, losing the option for consumers to choose reticulated renewable gas as an energy source. Consumers could also make inefficient appliance choices; for example opting for fossil gas appliances and then finding that gas network service ceases.

Consultation question	Response
What is needed to ensure fossil gas availability over the transition period?	There are different issues across the gas supply chain that need consideration to ensure that fossil gas is available to consumers over the transition. To ensure that gas pipeline infrastructure services are available through the transition a minimum level of investment and operating expenditure is needed to enable secure, reliable and safe provision of pipeline services for as long as they continue to be provided. This means that the regulatory framework needs to continue to provide incentives to invest – which is challenging because that framework should also discourage any increase in asset stranding risk. As noted below, addressing this conflict implies a potential role for Government.
Does the Government have a role in enabling continued investment in the gas sector to meet energy security needs? **If yes, what do you see this role being?**	The Government will need to be prepared to have a role in enabling continued investment in gas pipeline infrastructure to meet energy security needs. Risks and decisions about the gas transmission pipeline network could contribute to national energy security concerns given the transmission system is the backbone of Aotearoa New Zealand's reticulated gas network system. At a distribution level, risks and decisions about the gas distribution business may give rise only to local energy security concerns. Modelling undertaken by the Working Group indicates that the networks could start to become economically unsustainable within the next decade in certain circumstances. Shutting down uneconomic sections of gas networks will be one logical response, but this will need to be undertaken in an orderly phased manner to avoid undue harm to consumers and other stakeholders. Due to factors such as constraints in availability of resources, shutting down network sections and transitioning consumers to alternative energy sources would need to be phased in over several years. There will also need to be contingency planning in the event that such a transition cannot be managed effectively. GPBs may, therefore, need to continue incurring some operating and capital expenditure to support continued provision of secure, reliable and safe gas infrastructure services in an environment where demand and revenues continue to decline, and the economic life over which new investments can be recovered is reducing. Possible solutions are discussed in the Working Group's *Solutions Scoping Paper* and are summarised above. Inevitably there will need to be some balance struck between consumers funding the costs of the transition (e.g., via tariffs, or EV feebates) and taxpayers (e.g., via Government Investment in Decarbonising Industry Fund, hydrogen consumption subsidies and the like). Key questions are what the appropriate balance should be, and what should any Government (i.e., taxpayer) funding be direct towards. Answering these questions will likely require further, detailed, investigation.

Issue 3: Affordability risks for consumers

Consultation question	Response
Does the Government have a role in supporting vulnerable residential consumers as network fossil gas use declines? **If yes, what do you see this role being?**	We agree with the concerns raised in the Issue Paper about: • low-income users and renters being burdened over time with an increasing share of pipeline costs, and • the potential burden of high switching costs; and The Working Group's analysis suggesting that prices could more than double by 2040 (ignoring inflation) and that the magnitude of total conversion costs – currently estimated at between $7.3 billion and $7.9 billion – suggests impacts on vulnerable consumers that are large enough that warrant Government action. The Government's role will likely evolve through the transition. It is unlikely that there will be a single solution, and that a range of solutions will be required. An immediate priority would be for the Government to look at low cost solutions that help minimise total switching costs in future.

Attachment C | Gas Infrastructure Future Working Group outputs

- Findings Report, August 2021
- Solutions Scoping Paper, November 2021
- Initial Analysis Paper, March 2022
- Further Analysis Paper, March 2022
- Gas Transition Analysis Paper, June 2023
- Network Rightsizing Report, August 2023