Submission on the *Gas Transitions Plan Issues Paper*

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Release of information

Please let us know if you would like any part of your submission to be kept confidential.

☒ I would like to be contacted before the release or use of my submission in the summary of submissions that will be published by MBIE after the consultation.

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N/A

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Responses to questions

Chapter 2: Transitioning our gas sector	
1	**How can New Zealand transition to a smaller gas market over time?**
	Support of on shore development and storage development. Can maybe be used for biogas also.
2	**What is needed to ensure fossil gas availability over the transition period?**
	Storage investment. Can maybe be used for biogas also.
3	**What factors do you see driving decisions to invest or wind down fossil gas production?**
	Longevity
4	**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?**
	Yes. De-risking investment in onshore gas and contracts from Methanex and Balance.
5	**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?**
	Yes. Support of pipeline cost short term and support to transition long term to biogas and electricity.
	Fossil gas and electricity
6	**What role do you see for gas in the electricity generation market going forward?**
	Peaking and firming.
7	**What would need to be in place to allow gas to play this role in the electricity market?**
	Investment and de-risking.
8	**Do you think gas can play a role in providing security of supply and/or price stability in the electricity market? Why / Why not?**
	Yes. In the short term, it represents a more secure option while awaiting maturity of alternatives.
9	**Do you see alternative technology options offering credible options to replace gas in electricity generation over time? Why / Why not?**

	Eventually, yes. A combination of more renewables, more storage, and wider, intelligent demand response
10	**If you believe additional investment in fossil gas infrastructure is needed, how do you think this should be funded?**
	Needs a whole of sector approach. Maybe a new version of "Think Big" but for Transition – *Think Smart at Scale*.
Chapter 3: Key issues and opportunities	
	Renewable gases and emissions reduction technologies
11	**On a scale of one to five, how important do you think biogas is for reducing emissions from fossil gas? Why did you give it this rating?**
	5 - because of cost and limit on supply. It has the ability to reduce GHGs by replacing their usage with a more local source fuel. Additionally, the overall emissions during biogas production are lower than those associated with natural gas extraction. Also helps tackle waste treatment – converting existing waste products into energy. Biogas can be used for a wide range of applications, including electricity generation, heating, and as a fuel for vehicles. It can be injected into the natural gas grid or used in combined heat and power (CHP) systems. Biogas also has the potential to be upgraded to a higher calorific value fuel such as hydrogen or liquefied methane. Using biogas can enhance energy independence for regions (municipal and industrial).
12	**Do you see biogas being used as a substitute for fossil gas? If so, how?**
	Yes, Good for assisting in the transition. There are case studies in the country, such as the Hampton Downs landfill in Waikato (installed in 2009), which uses biogas generated from the landfill to produce electricity to run the landfill site's needs and to supply surplus energy to the national grid. Waste Management New Zealand is already powering rubbish collection from energy generated from landfill waster, creating a more circular economy. Anaerobic digesters on Fonterra's sites (study with Beca, Firstgas Group and EECA) are examining the potential for biogas from dairy waste, with anaerobic digestion being an energy efficient and natural mechanism for producing biogas, as well as creating other positive by-products such as biofertilisers. The potential for this technology to be utilised in future landfills, or investigation into its usage in other types of waste management systems, could utilise biogas for energy which would otherwise be going to waste. Substitution for fossil gas would be dependent on land/space required for anaerobic digesters and pre-treatment facilities, incentives for the creation of bioreactor landfills and biogas, and the ability to process biogas for usage in the existing gas infrastructure. Additionally, the degree to which biogas can replace fossil gas depends on local conditions, efficient collection

	and distribution infrastructure, in place. Biogas production can also be influenced by seasonal variations in feedstock supply.
13	**On a scale of one to five, how important do you think hydrogen is for reducing emissions from fossil gas use? Why do you think this?**
	4 - As an alternative to fossil gas use, it has potential, but requires significant research and development, an enabling environment and infrastructure development to be able to fully harness its capabilities.
14	**Do you see hydrogen being used as a substitute for fossil gas? If so, how and when?**
	Yes, in part. Two major use cases for hydrogen are in industrial processes and transport applications – effectively two harder-to-abate sectors where electrification is proving challenging. If hydrogen can be utilised in industrial processes (e.g. production of fertiliser, chemicals, steel) successfully, then it removes the option of potentially requiring industry shut down. For transport, marine and aviation represent the sectors harder to electrify and hydrogen may be a potentially more viable solution.
15	**What else can be done to accelerate the replacement of fossil gas with low-emissions alternative gases?**
	In terms of hydrogen, as noted in responses to the Interim Hydrogen Roadmap, regulations that favour clean energy, incentives for research & development, and tax benefits for hydrogen-related activities can significantly boost the sector. The commercial viability of hydrogen also requires strong cross-sector collaboration (academia, industry, governments and communities) and international partnerships to provide valuable insights, shared R&D costs, and market opportunities.
16	**On a scale of one to five how important is a renewable gas trading to supporting the uptake of renewable gases? Why have you given it this rating?**
	4 - Market mechanisms may assist in the transition of renewable gases in an economically efficient manner.
17	**What role do you see for the government in supporting such a scheme?**
	Providing incentives for uptake/transition, if not determining the structure of such a scheme.
	Carbon Capture, Utilisation and Storage
18	**On a scale of one to five how important do you think CCUS is for reducing emissions from fossil gas use? Why did you give it this rating?**
	5 - There are more efficient ways to reduce emissions, such as electrification of as much energy use as possible (including transport), and a reduction in air travel and dairy farming. These may be considered unpopular or even politically sensitive. Carbon Capture and Storage (CCS) is an

alternate second-best option and a requirement to meet our Paris Agreement and legislated commitment to net-zero carbon emissions by 2050. Taking CO_2 from point sources such as Huntly, Glenbrook, Fonterra, Taranaki petroleum fields and geothermal fields could reduce CO_2 emissions significantly. For the petroleum and geothermal, infrastructure for direct capture is in place. For industry locations, there are potentially suitable sedimentary and volcanic reservoir rocks that are proven reservoirs for sequestering CO_2.

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What are the most significant barriers to the use of CCUS in New Zealand?

The costs of CCS might be tough for a small economy like New Zealand, but such proven technology and costs should be seen in light of the cost of New Zealand's Emission Trading Scheme carbon credit costs. Furthermore, injecting CO2 in the ground via CCS needs to be evaluated from cultural and political perspectives, as there may be scepticism from iwi and hapū on environmental grounds. Costs and incentives to invest in the technology is another potential barrier. If infrastructure is in place, the cost of CCS is significantly reduced. Otherwise, costs to perform a geological and engineering assessment and pilot studies require government support (e.g., from MBIE).

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Do you see any risks in the use of CCUS?

If done poorly, CO_2 injection could induce seismicity, but decades of experience with CCS in fields such as Sleipner and Weyburn should be a guide to good practices. CO_2 is known to mineralize with volcanic/mafic rocks, avoiding leakage. In sedimentary rocks, if the right rocks and environment is selected the risk of leakage is minor as shown by Sleipner field in the North Sea operating as a CCS for three decades now. Projects like dunite reaction (rock weathering) are a way forward but may lack the ability to scale up for significant impact (conversely, every little bit may help us to meet our climate targets). Such technology is at the research state compared to CCS in geological formations which is proven. The energy and mining required for dunite rock, and well as the effect rock weathering has on waterway is critical to consider. Such environmental challenges do not exist for carbon capture and sequestration in geological formations.

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In what ways do you think CCUS can be used to reduce emissions from the use of fossil gas?

Points of CO_2 production should be prioritised for a quick turn-around with CCS (e.g. Huntly, Glenbrook which emit 2.4 and 1.3 Mt/yr, respectively). Depleted gas fields are also very good targets for large scale CCS, as we learned internationally. We need geologically suitable reservoirs for CCS so that it is safely sequestered – further expert geological opinion would be required to determine if NZ have sufficient supply of these.

Options to increase capacity and flexibility of gas supply

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What role do you see for gas storage as we transition to a low-emissions economy?

Meeting peaks in electricity usage to medium term at least. Dispatchable thermal electricity demand is not necessarily small or declining.

23	**On a scale of one to five, how important do you think increasing gas storage capacity is for supporting the transition? Why did you give it this rating?**
	4 - Demand response does not really exist on a large scale – need storage at least to medium term.
24	**What should the role for government be in the gas storage market?**
	Incentivise in the short to medium term.
25	**Our position is that LNG importation is not a viable option for New Zealand. Do you agree or disagree with this position? If so, why?**
	Agree - LNG importation is expensive, not carbon neutral and provides a risk of reliance on overseas imports. That being said, a potential alternative of local LNG production would still be an unattractive proposition for the first two reasons.
26	**What risks do you anticipate if New Zealand gas markets were tethered to the international price of gas?**
	Cost escalation, supply risk, locking in fossil gas production/reliance.

General comments

Further comments on CCS:

- CCS could be expensive (and costs energy, with potential emissions), but may be a required option to meet our climate targets. If carbon credits are on par or more expensive than the CCS option, then the technology is viable. Geosequestration of CO2 is not 'expensive' in Europe (e.g. Norway, The Netherlands) because the carbon credits are high in these countries (a political decision).
- Recommend reducing emphasis of CO2 reactions/weathering with dunite in favour of more developed geosequestration in geothermal reservoirs (already NZ trials) and depleted Taranaki fields. It has merit, but not as a priority over geosequestration.