

25 October 2019

Sarah Stevenson
Manager, Resource Markets Policy
Ministry of Building, Innovation and Employment
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Emailed to: resource.markets.policy@mbie.govt.nz

Dear Sarah

A vision for hydrogen in New Zealand – Green Paper

The Firstgas Group (Firstgas) welcomes the opportunity to comment on the Government's *Green Paper – a vision for hydrogen in New Zealand* (the Green Paper), released by the Ministry of Business, Innovation and Employment (MBIE) in September 2019.

Firstgas supports the current initiatives to introduce hydrogen as a low emissions fuel in New Zealand. We think the transition to a lower emissions economy will require new fuels and energy vectors to be tested and explored. As far as hydrogen is concerned, New Zealand has many of the infrastructure and market characteristics to successfully integrate hydrogen into the energy system. We are also encouraged by the global focus on hydrogen and think it's a good time to explore options to develop a hydrogen market in New Zealand.

Our submission provides general comments on hydrogen based on our own investigations into repurposing Firstgas pipelines for hydrogen transport, and what we are observing globally. We then make specific recommendations on how to accelerate market development in New Zealand.

About Firstgas

Firstgas Limited owns and operates more than 2,500 kilometres of high-pressure gas transmission pipelines that supply natural gas from Taranaki to industrial consumers throughout the North Island. We also operate more than 4,800 kilometres of gas distribution networks across the North Island. These networks provide gas distribution services to gas retailers who sell gas to more than 60,000 customers across Northland, Waikato, the Central Plateau, Bay of Plenty, Gisborne and Kapiti regions.

The Firstgas Group also owns energy infrastructure assets across New Zealand through our affiliate Gas Services NZ Limited (GSNZ), a separate business with common shareholders that owns the Ahuroa gas storage facility and Rockgas. The Ahuroa gas storage facility (trading as Flexgas Limited)¹ is a depleted gas field that has been re-purposed to store large amounts of energy for release when New Zealand energy users need it most (e.g. due to low hydro inflows or during periods of high demand). It can store up to 18PJ of gas, with expansion planned over the next two years to increase the injection and withdrawal rates of the facility. Rockgas² has over 80 years' experience providing LPG to 100,000 customers throughout New Zealand.

Maximising the value of Firstgas pipeline infrastructure

Our pipeline assets are a critical part of New Zealand's energy infrastructure. As New Zealand transitions to a lower emissions economy, a key strategic focus for Firstgas is to maintain a secure and affordable energy supply – whether that be natural gas, LPG, hydrogen, biogas, or blends of gas. The use of gas helps to support a high-renewable electricity grid, offers the potential to reduce process heat emissions that would otherwise come from burning coal, and complements new technologies such as electric vehicles and solar PV that reduce domestic energy emissions.

¹ Visit the website www.flexgas.co.nz

² Visit the website www.rockgas.co.nz

Hydrogen has the potential to be used in Firstgas pipelines either on its own or blended with natural gas. This would use our assets in different ways, while still ensuring New Zealand has a range of energy generation and transmission options that support energy security and system resilience.

Firstgas' contribution to a New Zealand hydrogen market

Firstgas is positive about the future role of hydrogen in New Zealand and we are excited to be part of the development of New Zealand's hydrogen market. We have committed to undertake a pilot trial to establish if Firstgas pipelines can be repurposed to transport hydrogen and blends of hydrogen and other gases safely and effectively. If successful, this will potentially provide a basis for an expanded trial. The work is supported by a grant from the Provincial Growth Fund³ and involves collaboration across a range of organisations.

Firstgas is an active member of the Hydrogen Association and will be working with the New Energy Development Centre recently established in New Plymouth as the pilot trial proceeds.

Global hydrogen trials and industry support are encouraging

Numerous hydrogen trials are underway overseas, and several businesses are exploring the viability of hydrogen or hydrogen blends for transport in gas infrastructure:

- The **University of California, Irvine**⁴ has successfully implemented the first power-to-gas hydrogen pipeline injection project in the United States. It has converted surplus sustainable energy from solar panels or wind farms into hydrogen and injected this into the campus power supply, demonstrating how natural gas infrastructure can support renewable energy; and
- **HyDeploy**⁵ is a pioneering hydrogen energy project, where Cadent (UK operator of largest gas distribution network) will run a live trial of blended hydrogen and natural gas on part of the private gas network at Keele University campus in Staffordshire.

These trials will provide useful insight into how cities can utilise existing gas infrastructure to transport low emissions fuels and lower their emissions. The trials highlight the opportunity that New Zealand has to reduce its own emissions through the use of hydrogen.

Support for Green Paper

Firstgas is encouraged by the Green Paper and believe it demonstrates the Government's support for what could eventually become an entirely new fuel market in New Zealand. It is a useful document that provides an excellent view of the role that hydrogen could play in the New Zealand economy.

As with any new industry, there are likely to be a myriad of technical, commercial and regulatory challenges as the industry becomes established. It is reassuring to see that the Green Paper is seeking to understand and address these challenges. The Green Paper and Government support creates positive investment signals which we also welcome.

Specific recommendations to help accelerate hydrogen market development

The market for hydrogen production and consumption in New Zealand will take time to develop and will require a level of care and diligence to ensure it is done safely. Firstgas support's any well considered initiatives that speed up the market development process. We provide our views on some key areas where this could be achieved below.

Change New Zealand Standard 5442 to progressively increase hydrogen volumes in pipelines

The use of Firstgas' existing pipeline networks will be a key enabler of the hydrogen market. An important option to accelerate growth of a hydrogen market is to blend hydrogen with other gases and transport that gas via pipeline. For this to occur, New Zealand Standard 5442 will need to be adjusted to allow larger volumes of hydrogen than currently used in New Zealand pipelines. Firstgas previously commented on this in our 2019 submission on proposed Gas Act⁶ changes.

We believe that clarity is needed on who should take the lead and drive the change required to amend NZS5442 to explore elevated levels of hydrogen in natural gas. We think MBIE is well placed to act in this role and to ensure any changes to NZS5442 are prioritised.

³ <https://firstgas.co.nz/news/hydrogen-pipeline-project-gets-government-funding/>

⁴ <https://www.universityofcalifornia.edu/news/national-first-uc-irvine-injects-renewable-hydrogen-campus-power-supply>

⁵ <https://hydeploy.co.uk/>

⁶ https://firstgas.co.nz/wp-content/uploads/First-Gas-submission_Options-for-amending-the-Gas-Act-1.pdf

Ensure policy settings for process heat encourage “highest and best use approach”

We don't expect hydrogen to be appropriate in some process heat applications. Like electricity, it may not be the best solution for all applications. We want policy settings to encourage a “highest and best use” approach to process heat. This is to ensure the most appropriate heat solutions are chosen based reducing carbon intensity, rather than encouraging a particular fuel. This requires energy policies agnostic to the source of heat while encouraging examination of different options.

Policy direction on process heat is currently being led by the Energy Efficiency and Conservation Authority (EECA). The decarbonisation of process heat paper jointly released by MBIE and EECA identified hydrogen as a potential future source of energy for process heat, although we are unsure about next steps in the journey of increasing the use of hydrogen in industrial applications in New Zealand. More information in this area would be valuable.

Consider incentives to convert from more carbon intensive fuels to hydrogen

We think opportunities to encourage conversion of the heavy vehicle fleet to hydrogen could be encouraged by changing the structure of Road User Charges (RUC), through other means similar to the current RUC exemption on electric vehicles, or through tax incentives. The Government could also legislate renewable fuel obligations.

We think a full cost benefit analysis of these options and others has merit and should be investigated in the short term. We also suggest looking at options to incentivise hydrogen investment outside the transport sector, especially where large capital development costs delay opportunities to reduce emissions over the short and medium term.

Establish the market, then have the blue versus green hydrogen debate

Firstgas acknowledges the immediate emissions reduction benefits that could occur through production of hydrogen using only renewable energy. However, we are agnostic as to where the hydrogen comes from. In the context of hydrogen, we see Firstgas' future role as linking producers with consumers via reliable, affordable, safe infrastructure – just like we do today for natural gas.

Given the international focus on carbon capture and underground storage (CCUS), it seems possible that technological and market developments in blue hydrogen may make this a cost-effective reality (at scale) before green hydrogen. What matters is reducing carbon emissions, both blue and green hydrogen can help to reduce New Zealand emissions and we support work on both fronts.

Support carbon capture and underground storage initiatives

CCUS is increasingly acknowledged as having a critical role in reducing CO₂ emissions, especially heavy industries⁷. We believe investigation of CCUS as another emissions reduction option for New Zealand should be encouraged. CCUS could be used to sequester emissions where hydrogen is produced using hydrocarbons (aka blue hydrogen). As highlighted above, New Zealand's focus should be to establish a functioning hydrogen market before addressing the question about green versus blue hydrogen. CCUS could be an important way to minimise or reduce emissions while accelerating hydrogen market development using blue hydrogen.

Global investment in CCUS is continuing to grow. In 2018, there were 23 large-scale CCUS facilities in operation or under construction, capturing ~40 Mtpa of CO₂. A further 28 pilot and demonstration scale facilities are operating or under construction.⁸ As the operator of an existing gas storage facility, we are confident the CO₂ injection underground is already technical achievable in New Zealand.

Consider the impact of pipeline regulation under the Commerce Act

Gas transmission pipelines are regulated under Part 4 of the Commerce Act 1986. This impacts the amount of capital available for reinvestment in new projects. We encourage the Government to consider the extent to which this form of pipeline regulation could inhibit accelerated development of New Zealand's hydrogen market, and to work with the Commerce Commission to assess how regulation can help facilitate the change and prudent expenditure required.

⁷ https://www.bloomberg.com/opinion/articles/2019-10-21/amid-climate-change-the-heat-is-on-heavy-industry-to-decarbonize?utm_source=url_link

⁸ <https://www.globalccsinstitute.com/resources/global-status-report/>

Contact details

If you have any questions regarding this submission, please contact me on (04) 830 5306 or via email at josh.adams@firstgas.co.nz.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Josh Adams', with a stylized flourish at the end.

Josh Adams

Transmission Commercial and Ahuroa Business Case Support