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Building for Climate Change
Building Performance
Ministry of Business, Innovation and Employment
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Submitted via: BfCC@mbie.govt.nz

Dear Building Performance Team,

Building for Climate Change: Keeping options open for getting to net zero

Firstgas Group welcomes the opportunity to submit to the Ministry of Business, Innovation and Employment (MBIE) on its scoping documents "*Building for Climate Change: Transforming operational efficiency*" and "*Building for Climate Change: Whole of life embodied carbon emissions framework*" dated August 2020.

Summary of our submission

As members of the Climate Leaders Coalition and having committed to reducing our emissions by 30 percent by 2030, we support MBIE's efforts to measure and reduce New Zealand's emissions. We also believe that allowing building owners to make more informed choices about their energy use will help contribute towards New Zealand's shift to a net zero carbon economy.

We do not support the proposed framework facilitating a reduction in gas consumption as a prerequisite for net zero carbon buildings. This unnecessarily restricts the tools available to reduce our carbon footprint. There are a number of gas solutions available to assist buildings in achieving net zero carbon emissions, such as the use of green hydrogen, biogas, and bio-LPG for hot water heating, cooking and space heating.

In addition, it is important to separate coal from gas within the proposed operational emissions caps, since there is much we don't yet know about the most efficient, affordable and effective ways to decarbonise New Zealand's economy. There is a significant opportunity for decarbonised gas to help meet our future energy needs in an affordable and reliable way. Locking in operational emissions caps for gas now, ahead of the Climate Change Commission's first carbon budget, is premature.

Our submission focuses on three key points:

1. **Significant investment in decarbonising gas is already taking place** to develop green hydrogen, biogas and bio-LPG as realistic zero carbon complimentary allies to electricity. Firstgas Group is currently working on their development and application in New Zealand to reduce our domestic carbon footprint and enable export opportunities.
2. **There are substantial benefits in keeping options open** when setting the requirements for net zero carbon buildings. These benefits come in the form of potentially lower costs to households (maintaining affordability) and higher quality internal environments (warmer, drier, healthier), as feasible alternatives to electrification take shape overtime.
3. **The cap on fossil fuel combustion emissions be amended to focus on coal in the near term.** We support combustion emission caps for natural gas, but only if they are phased in overtime and subject to a review of the framework in 2025, to allow for a better understanding of the feasibility and cost of gas network decarbonisation.

As a provider of energy to home and commercial building owners, Firstgas Group has a keen interest in ensuring that owners have access to the best information possible on energy efficiency and use. We want to help consumers decarbonise their homes and commercial buildings, while keeping energy



costs affordable. We would welcome the opportunity to meet with the MBIE Building for Climate Change team to discuss the points raised through this submission.

We have provided two attachments with our submission:

- **Attachment 1** is a summary of Firstgas Group
- **Attachment 2** is a Firstgas infographic on the benefits of gas (including green hydrogen, biogas and bio-LPG).

What are zero carbon gas-based fuels?

Firstgas Group is exploring several alternative fuels that we expect will be part of New Zealand's zero carbon future. There are three gas-based fuels with the potential to help decarbonise New Zealand's energy needs – green hydrogen, biomethane and bio-LPG. We are currently looking into the generation, transmission and application of these fuels in New Zealand.

Biomethane (upgraded biogas)

We consider the production of biomethane (biogas upgraded to pipeline specification) through the anaerobic digestion of food waste and wastewater to be a significant opportunity.

Biogas is a mixture of gases produced by the anaerobic breakdown of organic matter. Biogas can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food waste. Biogas can then be upgraded via a scrubbing process to biomethane, which can be injected into the natural gas network without any changes to end use appliances. Larger buildings and housing complexes could also collect their wastewater and use that resource to produce electricity and heating onsite using technology that is already commercially available.

Currently, New Zealand produces 3.6 PJ per annum of biogas that is burnt at site for heating or electricity generation. We believe the potential for biogas is much greater. For example, the United Kingdom produced 120 PJ of biogas in 2017 and 12PJ of that was injected into the gas grid as biomethane.¹ In Germany, there are currently 232 biogas plants injecting biomethane into pipeline networks.

Firstgas Group is currently investigating the feasibility of injecting biomethane into one of our gas pipeline networks. We envisage that this biomethane market will grow substantially to assist in the decarbonisation of our gas network, without the need for users to replace existing gas appliances. The great thing about biomethane is that the technology is available now, and no changes to gas specification or infrastructure are required to implement this solution. The Government is backing biogas as demonstrated through it providing Provincial Growth Funding to the Ecogas plant in Reporoa. This plant will collect central North Island food waste and process it into energy and bio-fertiliser.

Green hydrogen

We see hydrogen as an exciting future fuel to support New Zealand's growing energy needs. Produced through the electrolysis of water, green hydrogen can be burnt in modified cooking appliances, provide space heating or generate onsite electricity via fuel cell, as demonstrated at The Event Complex Aberdeen² which provides 1.4MW of to the £333 million facility.

Green hydrogen is produced when leveraging New Zealand's abundant renewable electricity for the electrolysis process. The Government's Green Hydrogen Strategy identifies the potential for New Zealand when saying, "With green hydrogen we have opportunities to create new jobs, convert heavy transport away from fossil fuels, enhance our security of electricity supply and even create significant export revenue".

Firstgas Group is currently part-way through our initial study on injecting hydrogen into our network which received partial funding through the Provincial Growth Fund. We anticipate that this is the beginning of a programme of work to decarbonise our gas networks using green hydrogen. This could be done initially by introducing green hydrogen as a blend with natural gas, and ultimately replacing natural gas to completely decarbonise the use of gas for the 425,000 kiwis already connected to the gas network.

¹ DUKES Tables 6.6 and 6.1-6.3

² <https://fuelcellsworks.com/news/event-complex-aberdeen-teca-to-feature-uks-largest-hydrogen-fuel-cell-installation/>



Internationally, there are similar projects that are further along in their development. These include the HyDeploy decarbonisation trial at Keele University,³ the Leeds 21⁴ trial in the United Kingdom, and the work underway by Jemena in Australia to introduce hydrogen to the Sydney gas network.⁵ These projects provide an exciting glimpse into the future of New Zealand's gas network.

Gas appliance manufacturers are also preparing their devices for a low-cost rollout of green hydrogen. For example, Bosch has recently begun manufacturing a dual powered hot water heating system that can provide instant hot water using natural gas today, with the ability to switch to 100% hydrogen with a flick of a switch.⁶

We consider our networks to be hydrogen ready. We just need the regulations and technology to converge to allow us to serve New Zealand with a decarbonised gas network.

Bio-LPG

We are also investigating decarbonisation of our LPG network through the use of bio-LPG. There are currently several bio-LPG facilities worldwide producing gas from feedstock such as waste vegetable oil. This gas is currently used commercially in Ireland, the UK, Sweden and across Europe.⁷

We think that there is great potential to reduce carbon emissions from our LPG supply. The decarbonisation of LPG can be done without requiring the replacement of existing appliances, keeping costs lower for the growing number of customers using LPG.

Why should MBIE keep options open for getting to net zero buildings?

New Zealand has benefited to date from having the choice of electrical and non-electrical sources to meet our energy needs. Currently around 20% of New Zealand's energy needs are served by natural gas and LPG. Gas is used gas in many applications:

- Process heat
- Hot water heating
- Cooking
- Space heating.

There are multiple pathways for getting to net zero buildings, without losing the benefits of gas. The three options that are currently receiving the most attention and investment in New Zealand are green hydrogen, biogas (called biomethane when upgraded to pipeline specification), and bio-LPG, as we have outlined above.

We encourage MBIE to take a less aggressive approach to the capping of natural gas combustion emissions to allow for the market to respond and enact the decarbonisation of the gas network that have the potential to be a more affordable and reliable option for New Zealanders. It is therefore recommended that the cap on fossil fuel combustion emissions is amended to focus on coal in the near term. We support combustion emission caps for natural gas, but only if they are phased in overtime and subject to a review of the framework in 2025 in order to better understand the feasibility and cost of gas network decarbonisation, given the rapid evolution of this technology and its application in New Zealand.

We want to ensure that all zero carbon options are investigated to ensure that we go with the best future energy mix. The two fundamental reasons for keeping green hydrogen, biogas, and bio-LPG options open for getting to net zero are:

- **Cost and affordability.** Requiring new commercial buildings and homes to switch to electric appliances to achieve net zero will create significant costs. These costs are incurred throughout the supply chain from appliance replacements, internal wiring upgrades, electricity network upgrades and new electricity generation sources. Natural gas hot water heating is

³ <https://hydeploy.co.uk/>

⁴ <https://www.northerngasnetworks.co.uk/wp-content/uploads/2017/04/H21-Executive-Summary-Interactive-PDF-July-2016-V2.pdf>

⁵ <https://jemena.com.au/about/innovation/power-to-gas-trial#:~:text=The%20%2415%20million%20trial%20is,1.4%20million%20customers%20each%20year.>

⁶ <https://www.h2-view.com/story/worcester-bosch-officially-reveals-new-hydrogen-boiler/>

⁷ <https://www.shvenergy.com/biolpg/>



currently the most affordable way to heat water.⁸ Using this existing low cost supply chain, it is entirely possible that decarbonising gas provides the lowest total cost solution and therefore helps to reduce the cost to consumers.⁹

- **High quality energy supply.** The utilisation of natural gas has created warmer and healthier homes for New Zealanders. Natural gas heats water so that it is instantly available, never runs out, and requires no storage within the building – freeing up floor space for other productive uses or reducing the building footprint. These benefits also apply to LPG.

Conclusion

We therefore recommend that MBIE allows natural gas decarbonisation the time it needs to mature before precluding it in New Zealand's strategy for net zero carbon buildings.

In devising the operational efficiency framework, we urge MBIE to keep the options open to achieve our net zero carbon future. We believe gas and gas-based fuels can play a critical role in decarbonisation, while keeping the cost within reach for all New Zealanders.

If you have any questions regarding this submission, please contact me on 021 911 946 or via email at ben.gerritsen@firstgasgroup.co.nz.

Yours sincerely

Ben Gerritsen
General Manager Commercial and Regulation

⁸ <https://www.consumer.org.nz/articles/home-heating-costs-in-2020>

⁹ See Vivid Economics *Gas Infrastructure Futures in a Net Zero New Zealand* available here: <https://firstgas.co.nz/wp-content/uploads/16098-First-Gas-Future-of-Gas-Report-Dec18-FINAL-high-res.pdf>



Attachment 1: About Firstgas Group

Our vision is to lead the delivery of New Zealand's energy in a changing world. Our mission is to safely and reliably deliver energy that's affordable and accessible to Kiwi families and businesses. We're really proud of this and of the important role we play in Kiwis' lives.

Based in New Plymouth, Firstgas Group is an umbrella brand consisting of Rockgas, Firstgas, Flexgas and Gas Services NZ. Firstgas and Rockgas are consumer brands that supply LPG and natural gas to over 165,000 customers through their gas network of over 2,500 kilometres of high-pressure transmission pipeline and 4,800 kilometres of distribution pipeline in the North Island, 36 local LPG suppliers, and over 180 Refill and Save locations across New Zealand.

Flexgas and Gas Services NZ are energy storage, operations and maintenance brands who make sure gas can be delivered safely and continuously. Flexgas operates the Ahuroa gas storage facility in central Taranaki. Gas Services NZ provides operational and maintenance support to all gas infrastructure owners, including the brands within Firstgas Group.¹⁰

In New Zealand, effective large-scale energy storage options are limited to hydro storage, predominantly in the South Island, Ahuroa gas storage and the coal stockpile at the Huntly Power Station in the North Island. On its own, Ahuroa has a similar energy storage capacity to the sum of all South Island hydro storage. We believe Ahuroa will play an important role over the next decades as more intermittent renewable electricity generation is integrated into the electricity market, coal is phased out, and when South Island storage capacity is low or unavailable.

Firstgas is investigating opportunities for using our assets in ways that help to reduce New Zealand's carbon emissions. Our gas transmission and distribution networks cover much of the North Island and are ideally placed to support the development, transfer and use of emerging fuels such as hydrogen and/or biogas. In 2020, we will complete feasibility studies into the use of hydrogen in our gas network. This will be followed by a physical trial on part of our network. The feasibility work is part funded by the Provincial Growth Fund.

¹⁰ For more information on the Firstgas Group, visit www.firstgas.co.nz, www.rockgas.co.nz, www.flexgas.co.nz



Attachment 2: Firstgas Group infographic

