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Andrew Hume
Energy Markets
Ministry of Business, Innovation and Employment
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Sent via email: energymarkets@mbie.govt.nz

Dear Andrew

Process Heat in New Zealand

First Gas Limited welcomes the opportunity to make a submission to the Ministry of Business, Innovation and Employment (MBIE) and the Energy Efficiency and Conservation Authority (EECA) on the technical paper "*Process Heat in New Zealand: Opportunities and barriers to lowering emissions*".

Summary of key points

First Gas supports the Government's commitment to a net zero emissions target by 2050. MBIE and EECA's technical paper provides helpful insights to the emissions arising from process heat and canvasses a range of possible barriers that may prevent businesses from reducing their emissions. Our submission focuses on the following points:

- A credible emissions price and emissions trading scheme (ETS) should be the primary lever for incentivising businesses to invest in lower-emissions technology. To date, we do not consider that New Zealand has real experience with the effects of a meaningful carbon price. Nor have we seen much evidence of higher prices (\$25/ t CO₂) materially changing process heat decisions. The amendments underway are positive and should provide greater certainty;
- Considerable emission reduction benefits are available from converting industrial heat processes from coal to gas, and could help to achieve real progress over the next 5 – 10 years; and
- Investments in gas infrastructure could open up opportunities for the future deployment of hydrogen for industry, providing a valuable option for emissions reductions if New Zealand aims to substantially decarbonise process heat. While we accept that such conversions are not economic today, we see considerable value in preparing for the future deployment of lower carbon fuels.

We expand on these points below.

An effective ETS will be the primary lever to drive emissions reductions

First Gas considers that Barrier A ("the cost of emissions is not fully priced") is the key barrier to businesses investing in new technology and upgrades to reduce their process heat emissions. We believe that a credible emissions price and emissions trading scheme (ETS) should be the primary lever for incentivising businesses to make these changes.

As outlined in our submission to the Productivity Commission,¹ a credible emissions price (today and into the future) provides parties with certainty (particularly with investment decisions), promotes the right behavioural changes, and encourages research and investment in options with lower emissions.

¹ *Draft report – Low-emissions economy*, First Gas submission to the Productivity Commission, 8 June 2018, <https://firstgas.co.nz/wp-content/uploads/First-Gas-submission-to-low-emissions-economy-inquiry.pdf>

The ETS has not played this role to date. However, the amendments underway and the complementary roles of a Climate Change Commission (such as advising on carbon budgets) should provide greater stability in policy settings and more certainty for businesses.

To understand the extent of this barrier, we encourage EECA and MBIE to understand what level of carbon price would trigger the change in investment decisions that the government is trying to incentivise. This will provide insight into the need for other policy measures or interventions to drive the reduction in emissions sought from the process heat sector.

It is also important to consider how businesses can manage the variability and uncertainty about future carbon prices. Even if investors accept that carbon prices will rise above the current ETS cap of \$25/t CO₂, the trajectory of those price increases is extremely important for investments in lower emissions technologies. One mechanism that we believe has merit and we would support the Government investigating is the introduction of a fixed-for-variable carbon price hedge (i.e. a Contract for Differences or CFD). This would provide a clear signal that the Government is committed to a particular trajectory for carbon prices and would see the Government compensating investors in the event that carbon prices are suppressed by future policy decisions. The availability of this product would provide businesses with assurance around the business case for new investment, providing for no regrets decisions to outlay capital now (and scrap existing equipment) in order to avoid future carbon costs.

Benefits available from coal to gas conversions

We have previously pointed out to Government that there are emission reduction benefits available in the near-term from converting industrial heat processes in the north Island from coal to natural gas.²

First Gas has been in discussions with several parties about the possibility of connecting to our gas pipeline network. Natural gas is a viable and more efficient option for many of these businesses, depending on the distance to the closest gas transmission or distribution pipeline. In Table 1 below, we estimate the annual reductions in CO₂ emissions from substituting natural gas for coal in North Island industrial process heat plant.³

Table 1: Emission reduction potential from converting North Island industrial heat processes users to gas

Benefit 1: Converting North Island industrial processes from coal to gas					
Option	Coal use per annum		CO ₂ emissions – tonnes		CO ₂ reduction
	GJ	Tonnes	Status quo – coal	Equivalent gas	
Plant A	150,000	6,818	13,725	8,103	5,622
Plant B	1,500,000	68,182	137,250	81,029	56,221
Plant C	300,000	13,636	27,450	16,206	11,244
Plant D	250,000	11,364	22,875	13,505	9,370
Plant E	990,000	45,000	90,585	53,479	37,106
Total	3,190,000	145,000	291,885	172,321	119,564

There are broader benefits from switching from coal to natural gas. Using natural gas piped directly to site lowers the local pollution, from for example, ash particulates and coal truck movements. It also enables a new cost-effective source of energy for industrial, commercial and residential consumers in the region. In addition, that many of the challenges/barriers to other forms of process heat conversions do not apply to gas. From a process heat users perspective, it is a quality improvement but with a lower carbon footprint.

Barriers perceived to undertaking conversions

First Gas acknowledges that there are a number of factors that investors take into account when considering investments. These include production location decisions, future prices for their output, and other conditions that apply to production location decisions (such as water take and wastewater

² As discussed in paragraph 112, page 27 of the technical paper.

³ As reference in *Low-emissions economy*, First Gas submission to the Productivity Commission, 2 October 2017, https://firstgas.co.nz/wp-content/uploads/Productivity-Commission_Low-emissions-economy-Oct-2017.pdf

discharge consents). However, we believe the future carbon price clearly matters. To demonstrate this, we have undertaken some initial analysis to understand how the carbon price could affect an investors' decision to replace a coal boiler with a gas boiler:

- If an investor assumes a carbon price of \$25/tCO₂ over the next 15 years, that would justify investment of \$27 million today (assuming a 7% discount rate);
- In contrast, if an investor assumes that the carbon prices increases in 5 years' time to \$50/ tCO₂ and in 10 years' time to \$100/ tCO₂, then an investment of around \$55 million is justified.

The investments in coal to gas conversions we have identified require investments in new boilers and gas pipelines that are closer to \$55 million, rather than \$27 million. Clearly increases in the carbon price would better incentivise these conversions to occur.

Gas pipeline infrastructure provides opportunities for future fuels

We consider that investments in new natural gas infrastructure could open up opportunities for future fuels, rather than risk "long-term emissions lock in" as discussed in the technical paper.⁴

The Vivid Economics study⁵ we commissioned with Powerco explored three potential scenarios for the future use of the gas infrastructure, as New Zealand moves to a low-carbon economy. This included a "Green Gas" scenario that looked at repurposing gas pipelines to carry green gas (hydrogen or biogas). The Leeds H21 City Gate project, led by Northern Gas Networks, is currently examining the feasibility of converting its gas system from natural gas to hydrogen. This involves using the existing gas distribution network to supply hydrogen directly to businesses and consumers. We consider that this project will provide a detailed insight and an evidence base into the cost, policy and technical issues and opportunities involved with a full-scale conversion to 100% hydrogen.

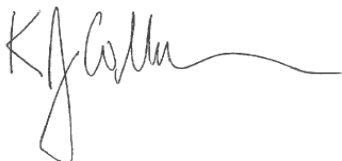
In the New Zealand context, the Vivid Economic study concluded that:

- Natural gas and gas infrastructure have high option value to address hard-to-treat sectors in a net zero New Zealand (including medium-high temperature process heat); and therefore
- It makes sense to keep these options open until the best decisions can be made about reducing hard to treat sectors in our country.

The study recommended that further research be undertaken to establish a techno-economic assessment of the potential for hydrogen and electrification options in New Zealand. It is encouraging to see that the Government is preparing a hydrogen strategy for New Zealand. This will provide a robust framework for exploring the potential of hydrogen, including its use in the process heat sector. Until this work is completed, we encourage the government to not discount the value the gas pipeline infrastructure could play in New Zealand's transition.

If you have any questions regarding this submission, please contact me on 027 472 7798 or via email at karen.collins@firstgas.co.nz.

Yours faithfully



Karen Collins
Regulatory Policy Manager

⁴ Paragraph 111, page 27 of the technical paper

⁵ Full report available on First Gas' website here: https://firstgas.co.nz/wp-content/uploads/16098-First-Gas_Future-of-Gas-Report-Dec18-FINAL-high-res.pdf