[redacted]

From: no-reply@mbie.govt.nz
Sent: Friday, 25 October 2019 3:37 p.m.
To: [redacted]; Hydrogen
Subject: Hydrogen green paper - submission
Attachments: Online-submission-form-uploadsHydrogen-green-paper20191025-Major-Gas-User-Group-Submission-on-A-Vision-for-Hydrogen-New-Zealand.pdf

Submission on Hydrogen green paper recevied:

Introduction

Name

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Business name or organisation (if applicable):

Major Gas Users Group

Position title (if applicable):

Secretariat

Is this an individual submission or on behalf of a group or organisation?

Behalf of group or organisation

Please give the name of the group or organisation this submission is on behalf of.

Major Gas Users Group

What is the role of Government in developing hydrogen for storage and distribution?

• The Government's role is to reduce uncertainties for the private sector making investment decisions that relate to hydrogen storage and distribution:
o Encourage and support research and learning environments including pilot projects to test storage and distribution requirements for H2 and develop appropriate standards for storage and distribution;
o Ensure regulatory framework that can provide acceptable standards for storage and distribution;

What are the challenges for using hydrogen for storage and distribution?

• Logistics capability (storage and distribution) needs to ensure security of energy supply
• Competing renewable energy options that may be more effective and efficient in delivering carbon neutral outcomes.

What are the opportunities for using hydrogen for storage and distribution?

• Use in existing infrastructure such as gas pipelines, within acceptable limits (20% currently indicated) , taking into account energy content and risks/impacts on diverse users.
• Underground storage in depleted reservoirs may be an option, but this will be determined by our unique geology (reservoir characteristics) and geography (distances to infrastructure and markets)

What is the role of Government in developing the complementary role of electricity and hydrogen?

• There are two alternatives to look at what is meant by complementary. It is not clear to us, what is being targeted by this question. Firstly, complementary can mean that hydrogen is used to lower the cost of marginal renewable electricity investment by monetising otherwise spare capacity to create a

product for purposes other than electricity (export, raw material input, process heat, etc.). The second complementary view is that hydrogen is used to store electricity and complements/ competes with other electricity storage options, such as pumped hydro storage. Under this meaning the function of hydrogen is to reduce the amount of peak electricity generation capacity that needs to be built to achieve 100% renewable generation capacity. Both may be valid perspectives, but it is not clear which alternative is the preferred public policy outcome.

• We suggest that the primary role of Government is to have an energy policy that provides for domestic energy security whilst also meeting its international obligations to reduce domestic carbon emissions. We do not consider it is the role of Government to promote hydrogen (or any other technology) as a solution to any of these objectives.

What are the challenges for achieving this complementary role of electricity and hydrogen?

• As per our response to the previous question, we do not assume that hydrogen is necessarily complementary with electricity unless it is demonstrated that it is an economically efficient alternative to other solutions and technologies that achieve the same broader public policy outcomes. E.g.

o H2 competitiveness with increased electrification (e.g. EVs, electric process heat, residential/ commercial heat pumps)

o H2 competitiveness relative to other electricity storage options (pumped hydro storage, existing hydro storage)

o H2 competitiveness with natural gas (including with CCS) to reduce overall carbon emissions

o H2 competitiveness with renewable alternatives (e.g. biofuels, hydro, geothermal)

o H2 supply at a scale that ensures levels of electricity security consistent with what is provided by fossil fuel (natural gas) backup supply.

o Understanding the impacts on the electricity market when investments are made to support hydrogen production. In energy intensive industries (such as for some of our members) the cost of electricity is an important factor in international competitiveness

What are the opportunities for this complementary role of electricity and hydrogen?

• Surplus hydrogen can store electricity – but only if more cost effective and efficient than say pumped hydro storage, or existing hydro storage.

• Hydrogen can monetise surplus renewable capacity accelerating efficient economic investment towards 100% renewable electricity generation target.

What is the role of Government in supporting hydrogen use for the transport sector?

No comment

What are the challenges when using hydrogen for mobility and transport?

No comment

What are the opportunities for using hydrogen for mobility and transport?

No comment

What is the role of Government in encouraging the use of hydrogen for industrial processes including process heat supply?

• Government sets policy outcomes (net carbon zero emission) but should remain neutral/ agnostic on how this achieved to ensure economically efficient investments are made.

• The Government does need to consider a policy and regulatory framework that encourages the appropriate private sector investment:

o Adoption of technology neutral instruments aimed at final consumers (emission restrictions, mandates for renewable energy content) – while addressing concerns related to carbon leakage.

o financial support instruments (e. g. capital expenditure subsidies, tax rebates and waivers) to cover the initial cost premium relative to incumbent technologies if that is what promotes the best long term public interest outcomes.

What are the challenges for using hydrogen in industrial processes?

- Investment in assets with remaining economic life designed to run on other fuels (sunk costs).
- There are currently some technical issues in relation to direct use of hydrogen for use in high grade heat (>650 deg C) requiring either combining hydrogen with CO2 in a methanation step, or blending with methane.
- Cost to reconfigure existing facilities may not be recovered over the lifetime of the facility.

What are the opportunities for the use of hydrogen in industrial processes?

- Hydrogen is already used as a feedstock in industrial processes (for example hydrogen peroxide, ammonia, or methanol) and can be substituted directly for Steam Methane Reforming process (SMR).
- Hydrogen can also be used directly for low grade heat by adapting burner design and settings.

What is the role of Government in encouraging hydrogen uptake for decarbonisation of our natural gas uses?

- This question assumes that natural gas does not have a role in reducing domestic carbon emissions. We disagree with that notion. Natural gas is an effective bridging option when it displaces coal and oil. Natural gas with CCS (blue hydrogen) may also be a more efficient technology solution than green hydrogen.
- Government should be technology neutral – decarbonisation of natural gas may be achieved in a number of ways including biofuels and electricity rather than hydrogen.
- Providing greater certainty on long term energy policy.
- Government should factor in and mitigate for carbon leakage risks when setting policies that reduce New Zealand manufacturers' international competitiveness.

What are the challenges for hydrogen to decarbonise the applications using natural gas?

- Primarily the challenge is whether hydrogen is the right/ economically rational solution to meet the broader policy objective of net zero carbon by 2050.
- Other challenges:

o There may not be sufficient and competitive supply of H2 to provide for energy security.
o Remaining economic life of assets using natural gas discourages early uptake of hydrogen.
o Infrastructure repurposing – i.e. natural gas transportation provides a single specification gas to consumers, all of whom would need to switch at the same time (including mass market) to a different specification gas. The mass market (residential and small commercial) is particularly difficult because households face different economic drivers than large industry. This might mean that gas is no longer available for mass market and that this market may be forced to switch to electricity. In turn this makes hydrogen transport through pipelines more expensive for remaining users based on current regulatory settings for regulated industries, including gas pipelines.

What are the opportunities for hydrogen to decarbonise our gas demand?

- Only where the life cycle costs and carbon footprint accounting can demonstrate that hydrogen is superior to natural gas and other competing renewable technologies including supply security.

What is the role of Government in producing hydrogen in sufficient volume for export?

- There is no role for Government to ensure sufficient volume of hydrogen for export. The primary concern for Government is in ensuring domestic energy security consistent with also meeting international obligations to reduce net carbon emissions.

What are the challenges for hydrogen if produced for export?

- Our domestic energy balance may not be in surplus to make New Zealand a net exporter of energy. Instead New Zealand will not only export energy but also domestic production overseas.
- Hydrogen gets priced out of the domestic market further reducing our energy security and economic diversity.

In addition, we welcome your feedback about the opportunities of hydrogen to Māori and how this will support their aspirations for social and economic development.

No comment

What are the opportunities for hydrogen if produced for export?

No comment

If you wish to, you can attach a document to this submission.

20191025-Major-Gas-User-Group-Submission-on-A-Vision-for-Hydrogen-New-Zealand.pdf - Download File

Use and release of information
We intend to upload submissions to our website at www.mbie.govt.nz. Can we include your submission on the website?

Yes

Can we include your name?

Yes

Can we include your email address?

Yes

Can we include your business name or organisation?

Yes

Can we include your position title?

Yes

Can we include the group or organisation your submission represents (if submitting on behalf of a group or organisation)?

Yes

If there are any other parts to your submission that you do not want public on the website please note them below:
OIA warning
If there is information in your submission that you wish to remain confidential, please note them below:

25 October 2019

Resource Markets Policy
Building Resources and Markets
Ministry of Business, Innovation & Employment
P O Box 1473
Wellington 6140
New Zealand
(via on-line submission)

RE: Submission on "A vision for hydrogen in New Zealand: Green Paper"

Major Gas User Group

1. This submission is on behalf of the Major Gas Users Group (MGUG). Nothing in this submission is confidential.

2. MGUG was established in 2010 as a consumer voice for the interests of a number of industrials who are major consumers of natural gas.

3. Membership of MGUG includes:

    - Ballance Agri-Nutrients Ltd
    - Oji Fibre Solutions (NZ) Ltd
    - Fonterra Co-operative Group
    - New Zealand Steel Ltd
    - Refining NZ

4. These industries are a significant part of New Zealand's economy, including; the primary industry export sector, in provision of energy security, and through import substitution assisting New Zealand's balance of payments. Their manufacturing base in New Zealand relies on a secure energy supply, which for natural gas includes secure and reliable gas transport (transmission and distribution). Collectively the group has invested significant long term capital in manufacturing facilities that consume about 30 PJ per annum of natural gas, or about 15% of the gas supplied to the market in New Zealand.

5. This submission covers what is agreed common ground for our members. Members also have their own unique industry and plant contexts that they may choose to highlight separately from the Group.

Other Context

6. We appreciate the opportunity to comment on the Government's green paper setting out the vision for hydrogen in New Zealand's energy mix as the Government looks for pathways to achieve an overall net zero carbon emissions future for the New Zealand economy.

7. We note in the Message from the Minister, which provides the wider context of the Green Paper, that the overall vision for New Zealand is to transition to a carbon neutral economy by 2050. The purpose of the Green Paper is to help the Government develop a renewable energy strategy for New Zealand, and to identify areas where the Government can make the biggest difference in incentivising and removing roadblocks for encouraging new technologies to come on stream. Green hydrogen is accordingly identified as one amongst a number of tools to help reduce global emissions.

8. Developing that context further, the International Renewable Energy Agency (IRENA) has reported that a study for the Hydrogen Council has estimated that by 2050, 18% of global final energy demand could be met by hydrogen. In other words, IRENA is saying hydrogen has a place within the energy system, but it is mostly a complementary role with electricity in decarbonising final energy demand.

9. The Minister's message seems to acknowledge that hydrogen is only one of a number of next generation fuels/ technologies. We assume that hydrogen's final place will be assessed within a wider renewable energy strategy and as one amongst a range of competing renewable energy technologies.

10. The more general point we wish to make when looking at green hydrogen and the role of Government, is that decision making should be guided by two overarching principles:

    a. The government should provide clarity and certainty on the primary policy outcome, i.e. net zero carbon emission by 2050, but be neutral on the right solution;

    b. Solutions and technology choices should be decided on what is economically efficient.

    While we respond directly to questions on hydrogen we do not specifically promote or agree that green hydrogen is the preferred alternative for meeting the broader Government aims for achieving carbon neutrality by 2050.

11. In line with those key principles we do not rule out the possibility that fossil fuels, particularly natural gas, will continue to play an essential transitioning role in decarbonising our economy. Natural gas can both help reduce carbon intensity in the final energy mix through coal and oil substitution, or by combining fossil fuel combustion with Carbon Capture and Sequestration (CCS) to create blue hydrogen.

12. Our submission focuses on answering the hydrogen questions specific to our member interests and expertise. We have chosen not to comment on hydrogen use in transport. We use the word "hydrogen" to mean "green hydrogen" unless stated otherwise.

Submission Questions

1a What is the role of Government in developing hydrogen for storage and distribution?

- *The Government's role is to reduce uncertainties for the private sector making investment decisions that relate to hydrogen storage and distribution:*

- *Encourage and support research and learning environments including pilot projects to test storage and distribution requirements for H2 and develop appropriate standards for storage and distribution;*
- *Ensure regulatory framework that can provide acceptable standards for storage and distribution;*

1b What are the challenges for using hydrogen for storage and distribution?

- *Logistics capability (storage and distribution) needs to ensure security of energy supply*
- *Competing renewable energy options that may be more effective and efficient in delivering carbon neutral outcomes.*

1c What are the opportunities for using hydrogen for storage and distribution?

- *Use in existing infrastructure such as gas pipelines, within acceptable limits (20% currently indicated) , taking into account energy content and risks/impacts on diverse users.*
- *Underground storage in depleted reservoirs **may** be an option, but this will be determined by our unique geology (reservoir characteristics) and geography (distances to infrastructure and markets)*

2a What is the role of Government in developing the complementary role of electricity and hydrogen?

- *There are two alternatives to look at what is meant by complementary. It is not clear to us, what is being targeted by this question. Firstly, complementary can mean that hydrogen is used to lower the cost of marginal renewable electricity investment by monetising otherwise spare capacity to create a product for purposes other than electricity (export, raw material input, process heat, etc.). The second complementary view is that hydrogen is used to store electricity and complements/ competes with other electricity storage options, such as pumped hydro storage. Under this meaning the function of hydrogen is to reduce the amount of peak electricity generation capacity that needs to be built to achieve 100% renewable generation capacity. Both may be valid perspectives, but it is not clear which alternative is the preferred public policy outcome.*
- *We suggest that the primary role of Government is to have an energy policy that provides for domestic energy security whilst also meeting its international obligations to reduce domestic carbon emissions. We do not consider it is the role of Government to promote hydrogen (or any other technology) as a solution to any of these objectives.*

2b What are the challenges for achieving this complementary role of electricity and hydrogen?

- *As per our response to the previous question, we do not assume that hydrogen is necessarily complementary with electricity unless it is demonstrated that it is an economically efficient alternative to other solutions and technologies that achieve the same broader public policy outcomes. E.g.*
    - *H2 competitiveness with increased electrification (e.g. EVs, electric process heat, residential/ commercial heat pumps)*

- *H2 competitiveness relative to other electricity storage options (pumped hydro storage, existing hydro storage)*
- *H2 competitiveness with natural gas (including with CCS) to reduce overall carbon emissions*
- *H2 competitiveness with renewable alternatives (e.g. biofuels, hydro, geothermal)*
- *H2 supply at a scale that ensures levels of electricity security consistent with what is provided by fossil fuel (natural gas) backup supply.*
- *Understanding the impacts on the electricity market when investments are made to support hydrogen production. In energy intensive industries (such as for some of our members) the cost of electricity is an important factor in international competitiveness*

2c What are the opportunities for this complementary role of electricity and hydrogen?

- *Surplus hydrogen can store electricity – but only if more cost effective and efficient than say pumped hydro storage, or existing hydro storage.*
- *Hydrogen can monetise surplus renewable capacity accelerating efficient economic investment towards 100% renewable electricity generation target.*

3a What is the role of Government in supporting hydrogen use for the transport sector?

- *No comment*

3b What are the challenges when using hydrogen for mobility and transport?

- *No comment*

3c What are the opportunities for using hydrogen for mobility and transport?

- *No comment*

4a What is the role of Government in encouraging the use of hydrogen for industrial processes including process heat supply?

- *Government sets policy outcomes (net carbon zero emission) but should remain neutral/ agnostic on how this achieved to ensure economically efficient investments are made.*
- *The Government does need to consider a policy and regulatory framework that encourages the appropriate private sector investment:*
    - *Adoption of technology neutral instruments aimed at final consumers (emission restrictions, mandates for renewable energy content) – while addressing concerns related to carbon leakage.*
    - *financial support instruments (e. g. capital expenditure subsidies, tax rebates and waivers) to cover the initial cost premium relative to incumbent technologies if that is what promotes the best long term public interest outcomes.*

4b What are the challenges for using hydrogen in industrial processes?

- *Investment in assets with remaining economic life designed to run on other fuels (sunk costs).*
- *There are currently some technical issues in relation to direct use of hydrogen for use in high grade heat (>650 deg C) requiring either combining hydrogen with CO2 in a methanation step, or blending with methane.*
- *Cost to reconfigure existing facilities may not be recovered over the lifetime of the facility.*

4c What are the opportunities for the use of hydrogen in industrial processes?

- *Hydrogen is already used as a feedstock in industrial processes (for example hydrogen peroxide, ammonia, or methanol) and can be substituted directly for Steam Methane Reforming process (SMR).*
- *Hydrogen can also be used directly for low grade heat by adapting burner design and settings.*

5a What is the role of Government in encouraging hydrogen uptake for decarbonisation of our natural gas uses?

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- *Providing greater certainty on long term energy policy.*
- *Government should factor in and mitigate for carbon leakage risks when setting policies that reduce New Zealand manufacturers' international competitiveness.*

5b What are the challenges for hydrogen to decarbonise the applications using natural gas?

- *Primarily the challenge is whether hydrogen is the right/ economically rational solution to meet the broader policy objective of net zero carbon by 2050.*
- *Other challenges:*
    - *There may not be sufficient and competitive supply of H2 to provide for energy security.*
    - *Remaining economic life of assets using natural gas discourages early uptake of hydrogen.*
    - *Infrastructure repurposing – i.e. natural gas transportation provides a single specification gas to consumers, all of whom would need to switch at the same time (including mass market) to a different specification gas. The mass market (residential and small commercial) is particularly difficult because households face different economic drivers than large industry. This might mean that gas is no longer available for mass market and that this market may be forced to switch to electricity. In turn*

this makes hydrogen transport through pipelines more expensive for remaining users based on current regulatory settings for regulated industries, including gas pipelines.

5c What are the opportunities for hydrogen to decarbonise our gas demand?

- *Only where the life cycle costs and carbon footprint accounting can demonstrate that hydrogen is superior to natural gas and other competing renewable technologies including supply security.*

6a What is the role of Government in producing hydrogen in sufficient volume for export?

- *There is no role for Government to ensure sufficient volume of hydrogen for export. The primary concern for Government is in ensuring domestic energy security consistent with also meeting international obligations to reduce net carbon emissions.*

6b What are the challenges for hydrogen if produced for export?

- *Our domestic energy balance may not be in surplus to make New Zealand a net exporter of energy. Instead New Zealand will not only export energy but also domestic production overseas.*
- *Hydrogen gets priced out of the domestic market further reducing our energy security and economic diversity.*

6c What are the opportunities for hydrogen if produced for export?

- *No comment*

Yours sincerely

Richard Hale
Hale & Twomey Ltd
Secretariat for the Major Gas Users Group