HIRINGA
The energy to change. Together.

Commerce Commission New Zealand

Open Letter – Ensuring our Energy and Airports Regulation is 'Fit For Purpose'

Hiringa Energy Ltd Submission

Confidentiality Notice

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1.0 Introduction

Green hydrogen is emerging as a key part of New Zealand's (and the world's) future energy mix.[1] The purpose of this submission is to ensure that green hydrogen is a part of our national energy transition conversation and to demonstrate that green hydrogen production and technology rollout is already underway. It is important that government agencies such as the Commerce Commission do what they can to ensure that green hydrogen is provided a level playing field against other new and incumbent fuels to allow it to play its role in decarbonizing the hard-to-treat sectors of our economy. [redacted]

2.0 About Hiringa

Hiringa is connecting the green hydrogen value chain.

Make Clean Hydrogen

We develop commercial scale **green hydrogen** production projects using electrolysis from renewable electricity and biogas, forming joint ventures with commercial and industrial partners.

Develop Hydrogen Infrastructure

Together with partners, we develop and invest in hydrogen distribution and refuelling infrastructure across New Zealand to **decarbonise heavy transport.**

Facilitate Market Use of H_2

Partnering with **New Zealand's largest road transport companies.**

Working with global manufacturers to introduce hydrogen technologies.

Establishing offtake for industry & export

[1] https://hydrogencouncil.com/wp-content/uploads/2021/02/Hydrogen-Insights-2021.pdf

2.0 Hydrogen General

Green hydrogen technology is ready for commercial deployment immediately and will enable the accelerated decarbonisation of multiple sectors, beginning with the emissions-intensive 'low hanging fruit' of the heavy transport sector.

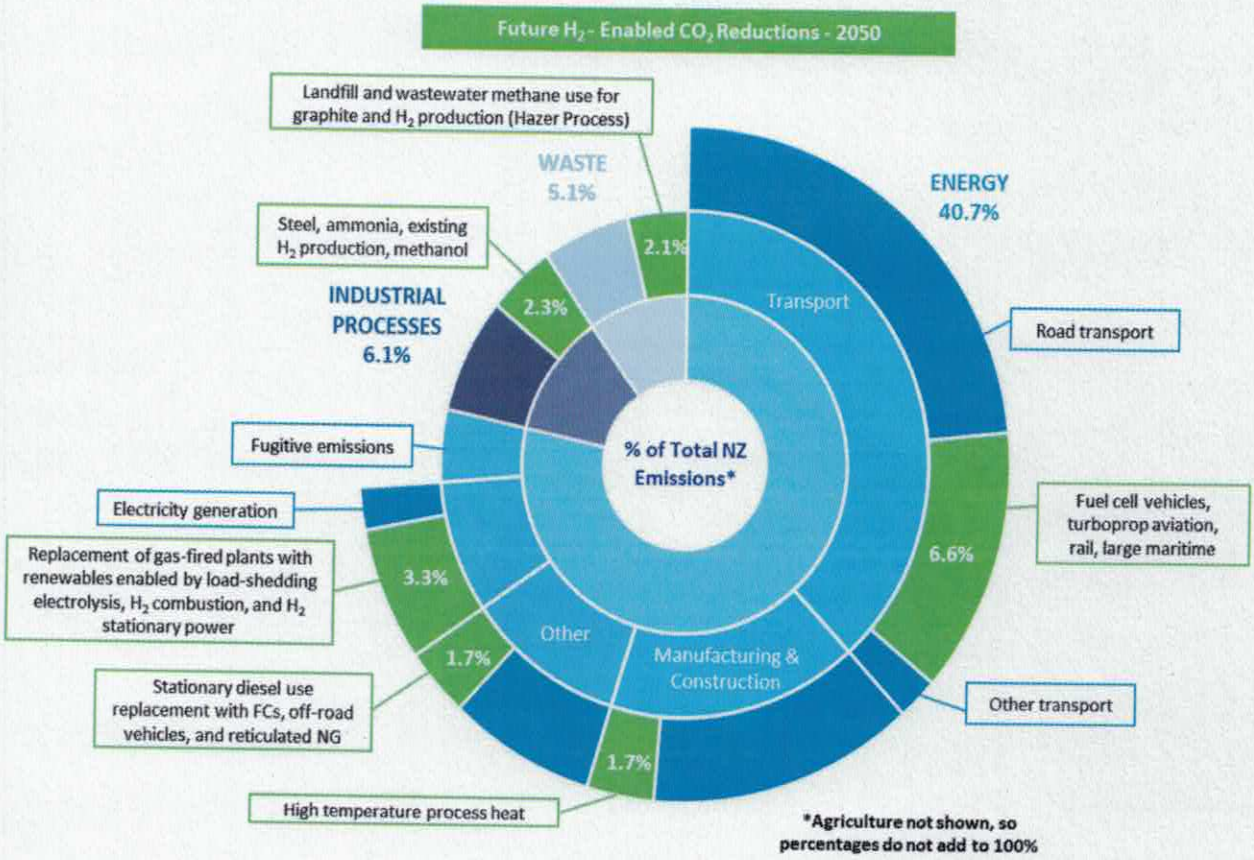

Figure 1. Hydrogen's Impact on Reducing Emissions (excl. Agriculture). Road transport market shares attributed to hydrogen are as follows: Vehicles >23t GVM (85%); 9-23t GVM (50%); 3-9t GVM (30%); Buses (75%); Cars (10%). 30% of aviation emissions, 30% of rail emissions, and 95% of domestic navigation (shipping) emissions are also included. In the Other category, 50% of emissions from off-road vehicles in agriculture and forestry are included.

New Zealand's energy future will be a combination of 'green electrons' and 'green molecules'. Green hydrogen (one type of green molecule) can penetrate hard to abate sectors more effectively than 'green electrons'. Green hydrogen is also the key building block of many other 'green molecules' such as ammonia, methanol and synthetic low carbon fuels. We need to apply the right technologies in the right sectors to transition quickly and affordably.

Green hydrogen improves the economics of renewable electricity generation projects through the conversion of off-peak electricity into a valuable commodity.

[redacted]

Green hydrogen reduces the need to overbuild renewable electricity to achieve a 100% renewable grid by providing the energy storage required to support the intermittency of renewables across days, weeks, months and years.

Infrastructure requirements associated with energy system transition need to be considered and communicated. Under an electrification-only scenario the cost may be borne by taxpayers in the form of lines charges, irrespective of their consumption or ability to pay. Hydrogen infrastructure, on the other hand, will be largely private sector funded and provides the ability for any price premium to be covered on a user pays basis.

There is significant investment in green hydrogen planned over the next 10 years which should be recognised and supported by government, as has been done by governments abroad. Over 30 countries have released hydrogen roadmaps, and governments worldwide have committed more than USD 70 billion in public funding.[2]

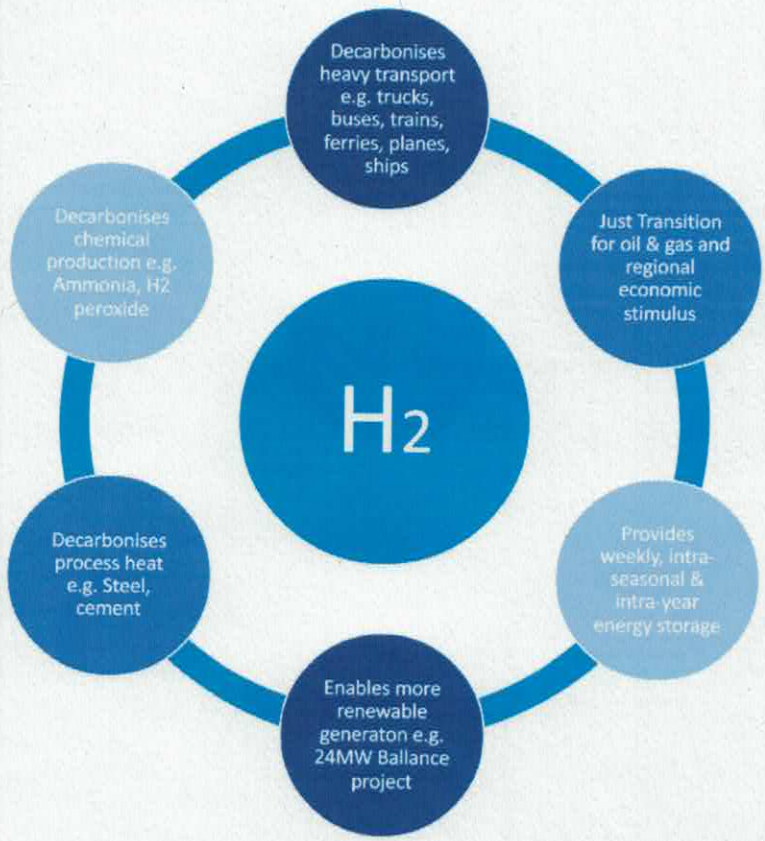

Figure 2. Hydrogen Decarbonises Hard to Treat Sectors and Supports the Electricity Grid

Green hydrogen is acknowledged as a cornerstone of our Just Transition within the energy sector through the creation of new domestic energy, fuel supply chains, and 'green jobs'. Transitioning the energy sector workforce is essential, especially with job losses already being seen in Taranaki as gas supply decreases.

[2] https://hydrogencouncil.com/wp-content/uploads/2021/02/Hydrogen-Insights-2021.pdf

There is existing international interest in New Zealand exporting green hydrogen. This door will close over time as trade relationships between green hydrogen producing and green hydrogen consuming countries are bedded in.

Hydrogen is rightly placed as one of the Government's pillars of its Energy Strategy and compliments other pillars such as Renewable Electricity Generation, Just Transition Work, Process Heat, and Backing Emerging Technologies.

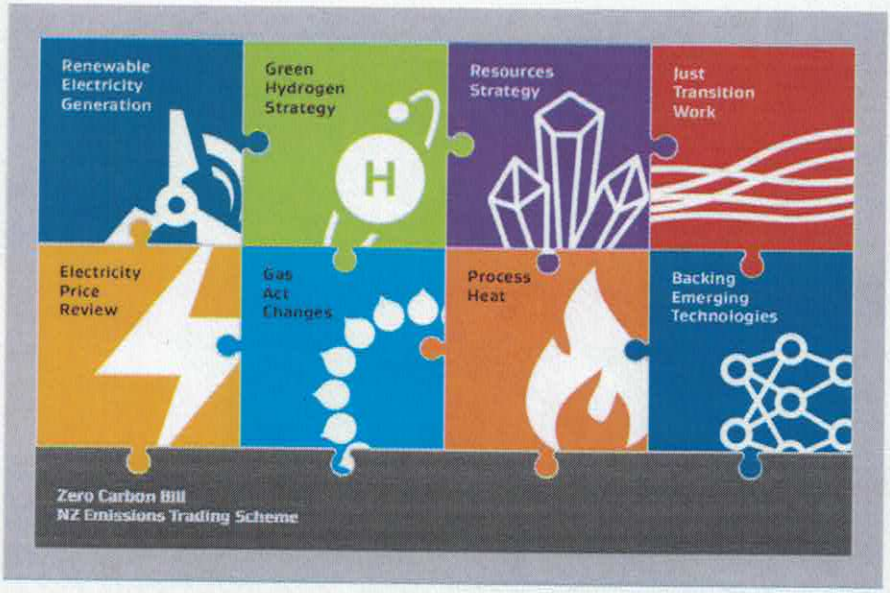

Figure 3. Government's Renewable Energy Strategy[3]

The cost of green hydrogen production is dropping rapidly, driven by the global acceleration of its commercialisation and ability to close-couple with the reducing costs of intermittent renewables such as wind and solar. [redacted]

The European Union's Hydrogen Strategy for a Climate Neutral Europe 2020 outlines how the European Union sees hydrogen as "...an intrinsic part of an integrated energy system". "In the integrated energy system of the future hydrogen will play a role, alongside renewable electrification, to achieve a **more efficient and circular use of resources**. Large-scale deployment of clean hydrogen at a fast pace is key for the EU to achieve a higher climate ambition...**in a cost-effective way**".[4]

The possibility of stranded natural gas assets should not preclude scaling up of green gases such as biomethane and hydrogen which can unlock deeper decarbonisation than electricity alone. The infrastructure required for hydrogen is relatively flexible, with multiple supply sources and locations, modular relocatable equipment, and investments that are scalable with demand, unlike our existing oil, gas, and electricity infrastructure assets.

[3] https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-strategies-for-new-zealand/
[4] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0301&from=EN

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[redacted]

4.0 Green hydrogen could be New Zealand's virtual-battery

Green hydrogen reduces the need to overbuild renewable electricity in order to achieve a 100% renewable grid by providing the energy storage required to support the intermittency of renewables across days, weeks, months and years. When generating electricity from stored hydrogen at times of peak demand, it reduces the requirement for additional wind, solar and hydro generation capacity to cover peak times.

Hydrogen can help optimise installed renewable energy capacity, reducing grid upgrades and avoiding peak charges.

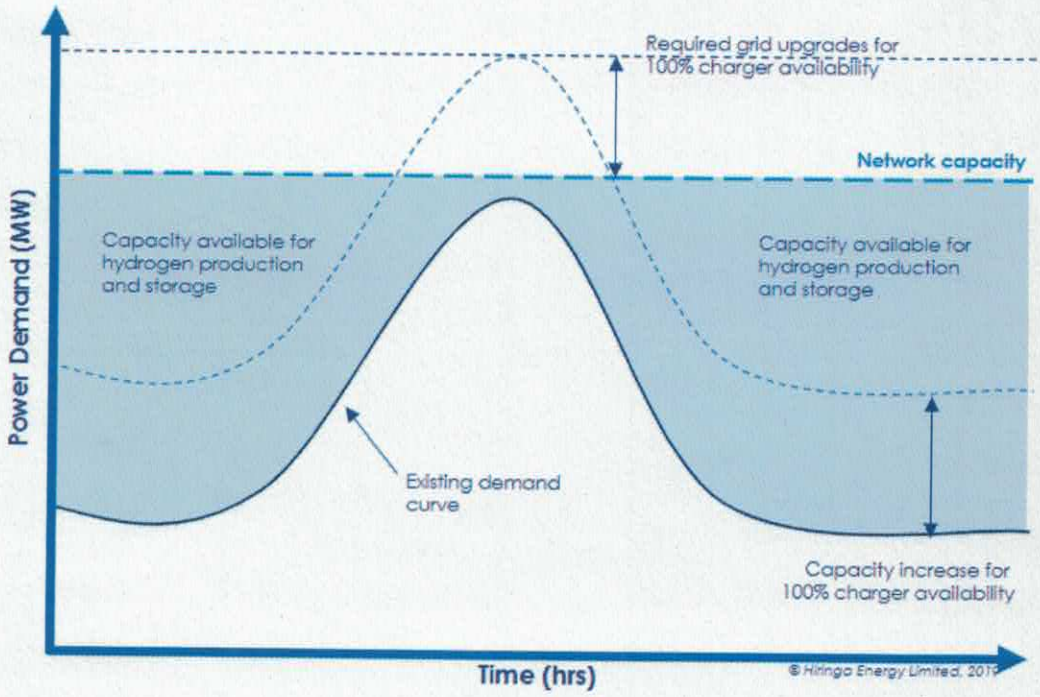


Figure 5. Hydrogen Supports Efficient Use of Our Grid

[redacted]

Using hydrogen to store renewable energy increases the resilience our energy system through diversifying across electrons and molecules. Storing excess renewable energy as hydrogen until it is required also increases our energy independence.

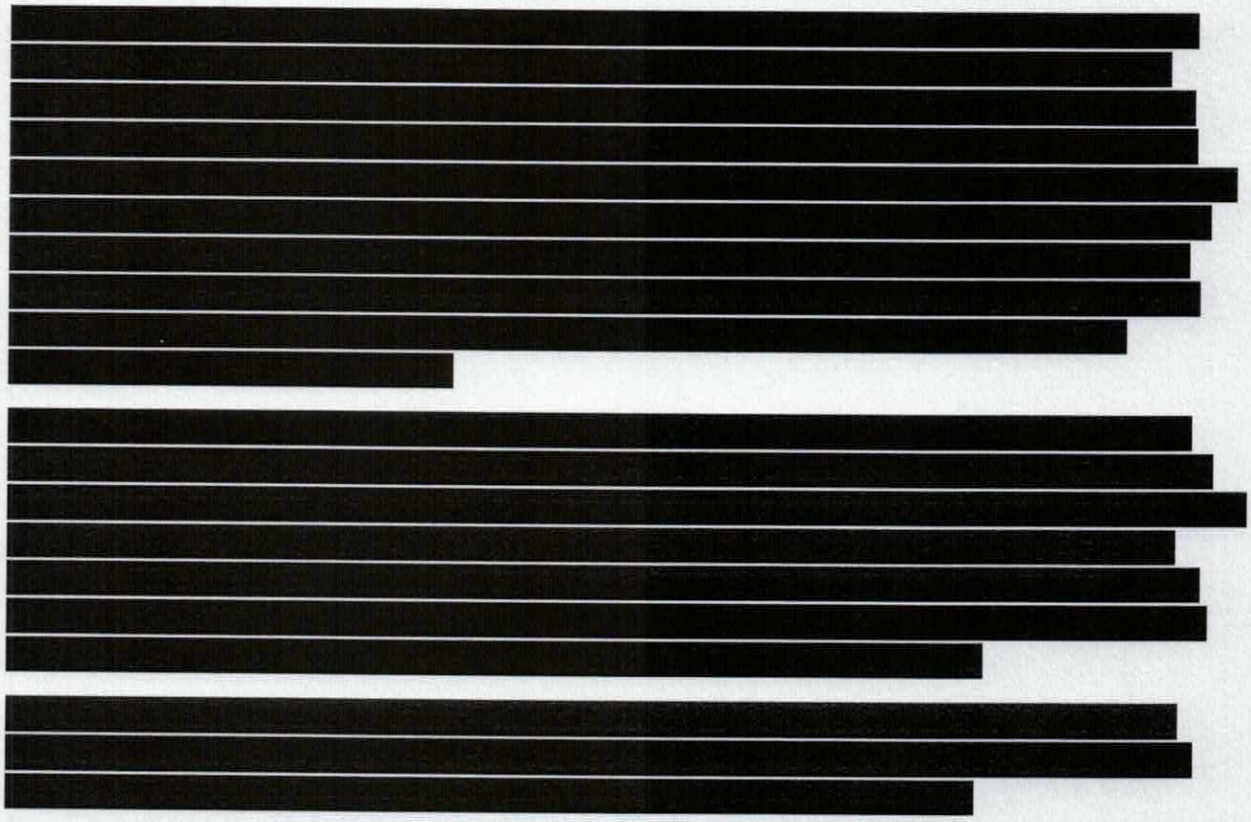
[5] https://firstgas.co.nz/news/firstgas-ahuroa-upgrade-provides-flexible-gas-supply-to-support-renewable-energy/

5.0 Green hydrogen helps achieve zero emission aviation

"As one of the hardest-to-abate sectors with high daily range requirements and weight constraints, aviation decarbonisation options remain limited. Biofuel is the most mature and proven technology available"[6], however it emits carbon and other particulates and faces feedstock competition with other sectors.

"Liquid clean hydrogen (LH2) is the only alternative fuel that abates all CO2 emissions from flying. Furthermore, LH2 can reduce a significant share of non-CO2 emissions like NOx and SOx, leading to an overall reduction of 50-90% in climate impact, which exceeds the reduction potential of all other alternative fuels. However, contrary to other sustainable aviation fuels, LH2 requires an overhaul of existing fuel infrastructure".[7]

"Hydrogen at scale can cost-effectively decarbonize flights up to the short and medium range categories, which account for 70% of global aviation CO2e emissions. Beyond the 10,000km range, the storage space requirements make hydrogen unfeasible in terms of cost".[8] Therefore for long-range flights, which account for 30% of global aviation CO2e emissions, synfuel and advanced biofuels are the most cost competitive decarbonisation options, both requiring significant volumes of hydrogen.



In the UK and Norway, public-private aviation working groups have been established to develop a coordinated approach towards a more sustainable aviation industry. A similar body set up in New

[6] https://hydrogencouncil.com/wp-content/uploads/2021/02/Hydrogen-Insights-2021.pdf
[7] https://hydrogencouncil.com/wp-content/uploads/2021/02/Hydrogen-Insights-2021.pdf
[8] https://hydrogencouncil.com/wp-content/uploads/2021/02/Hydrogen-Insights-2021.pdf

Zealand could identify and enable the policies and investment settings needed to support the development and commercial deployment of zero emission aviation.

[redacted]

[9] https://www.minister.industry.gov.au/ministers/taylor/media-releases/fast-tracking-renewable-hydrogen-projects

[redacted]

[10] https://www.fch.europa.eu/publications/study-strategies-joint-procurement-fuel-cell-buses
[11] https://www.iea.org/reports/the-future-of-hydrogen
[12] https://www.greenhydrogennz.com/
[13] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0301&from=EN

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[14] https://www.mbie.govt.nz/dmsdocument/6798-a-vision-for-hydrogen-in-new-zealand-green-paper
[15] https://www.iea.org/reports/the-future-of-hydrogen
[16] https://www.mbie.govt.nz/dmsdocument/6798-a-vision-for-hydrogen-in-new-zealand-green-paper
[17] https://www.nature.com/articles/s41467-019-09162-5