[redacted]

From: no-reply@mbie.govt.nz
Sent: Thursday, 24 October 2019 8:29 p.m.
To: [redacted]; Hydrogen
Subject: Hydrogen green paper - submission
Attachments: Online-submission-form-uploadsHydrogen-green-paperComments-on-hydrogen.pdf

Submission on Hydrogen green paper recevied:

Introduction
Name

David Reid

Email

[redacted]

Business name or organisation (if applicable):
Position title (if applicable):
Is this an individual submission or on behalf of a group or organisation?

Individual

Please give the name of the group or organisation this submission is on behalf of.
What is the role of Government in developing hydrogen for storage and distribution?

Nil.

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

It's expensive and energy intensive to manufacture, so can't compete with other fuels without major subsidies.
It's difficult and dangerous to transport and store. This is due it's explosiveness and to the high pressures it is held under. There have been several devastating explosions in storage facilities around the world.
Stationary storage. At the moment hydrogen isn't the answer here. There are other technologies already in use such as large batteries (eg South Australia's battery) which have the benefit of stabilising the network, or even pumping water uphill back into a dam.

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

nil

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

nil

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

It's expensive and energy intensive to manufacture, so can't compete with other fuels without major subsidies.
It's difficult and dangerous to transport and store. This is due it's explosiveness and to the high pressures it is held under. There have been several devastating explosions in storage facilities around the world.
Current production is based on using natural gas, this produces CO2 so is of no benefit. Electrolysis production is expensive.

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

nil

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

nil

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

It's expensive and energy intensive to manufacture, so can't compete with other fuels without major subsidies.
It's difficult and dangerous to transport and store. This is due it's explosiveness and to the high pressures it is held under. There have been several devastating explosions in storage facilities around the world.
If used for transport, the vehicles to use it are relatively expensive to manufacture. The technology is expensive and complicated.
When used to power cars, the refill stations are expensive (I believe about $US2million each) and can fuel up 1 vehicle in a matter of minutes, but then depending on the system, the next vehicle may need to wait 20 minutes for the system to recharge. This gives an upper limit of the number of vehicles that can be fueled in a day. I understand that in some urban locations overseas, fueling can't be done at night because of noise disruption caused by the station.

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

nil. Other technologies offer a much better bang for the buck and are available now.

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

no comment

What are the challenges for using hydrogen in industrial processes?

no comment

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

no comment

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

Nil.

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

For consumer use there are much better technologies than natural gas - usually mains electricity.

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

-

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

nil

What are the challenges for hydrogen if produced for export?

I don't believe the hydrogen manufacture for export is a great business to get into. Renewable energy production to produce hydrogen sustainably is getting to the point where anything other than wind and solar can't compete. Japan might as well have loads of solar panels on their roofs to produce electricity to manufacture hydrogen as NZ, and it saves on transport costs.

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.

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What are the opportunities for hydrogen if produced for export?

This survey is flawed as it gives no opportunity to address the incorrect statements in the paper. However I have put my thoughts down on the attached document.

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

[redacted]

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?

No

Can we include your business name or organisation?

No

Can we include your position title?

No

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

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:

Comments on "A Vision for Hydrogen in New Zealand"

1. Issues with hydrogen

At the moment hydrogen has some major issues:

1.1. It's expensive and energy intensive to manufacture, so can't compete with other fuels without major subsidies.

1.2. It's difficult and dangerous to transport and store. This is due it's explosiveness and to the high pressures it is held under. There have been several devastating explosions in storage facilities around the world.

1.3. If used for transport, the vehicles to use it are relatively expensive to manufacture. The technology is expensive and complicated.

1.4. When used to power cars, the refill stations are expensive (I believe about $US2million each) and can fuel up 1 vehicle in a matter of minutes, but then depending on the system, the next vehicle may need to wait 20 minutes for the system to recharge. This gives an upper limit of the number of vehicles that can be fuelled in a day. I understand that in some urban locations overseas, fuelling can't be done at night because of noise disruption caused by the station.

1.5. I don't believe the hydrogen manufacture for export is a great business to get into. Renewable energy production to produce hydrogen sustainably is getting to the point where anything other than wind and solar can't compete. Japan might as well have loads of solar panels on their roofs to produce electricity to manufacture hydrogen as NZ.

1.6. I can't comment on the production of hydrogen for industrial uses.

1.7. Stationary storage. At the moment hydrogen isn't the answer here. There are other technologies already in use such as large batteries (eg South Australia's battery) which have the benefit of stabilising the network, or even pumping water uphill – back into the dam!

2. The overseas experience

Norway are held up as what is possible with electric vehicles. They have also been promoting hydrogen. I understand the government has subsidised two companies to provide a hydrogen fuelling network. Unfortunately one company has gone bust, and the other had a major explosion at one of their fuelling stations, which resulted in their other stations being closed down, and no refuelling for people who own hydrogen vehicles.

3. Alternative solutions to hydrogen

I'd like to comment on Figure 16 in the paper as this graphic is quite misleading and there are viable alternatives:

3.1. Short distance vehicles and passenger cars: the paper implies that only internal combustion engines are suitable. This is incorrect as we already have suitable battery electric vehicles (BEVs). Easily chargeable at home, or anywhere there is electricity, currently the latest vehicles achieve 450 to 500km range. And we have a fast charging network to get a charge when away from home. Although a bit expensive at the moment, the forecasts I've seen predict price parity with fossil fuel cars by 2024.

3.2. Taxis and share cars: comments same as 2.1. I think I saw somewhere the average taxi mileage was 100km per day, easily suitable for BEVs. Already we have a few Nissan Leaf taxis in NZ.

3.3. Coaches and buses: Battery electric is the answer. In New Zealand we've only got a few demonstration models at the moment, but China had 250,000 battery electric buses as of 2017.

3.4. Rail: the answer has been around for over 100 years, and that is to electrify the tracks or overhead wires. Hydrogen, batteries and diesel not needed.

3.5. Trucks: short and long distance. We have a few examples of battery electric trucks in NZ at the moment, mainly used for around town deliveries. Overseas manufacturers are working to develop battery electric further. Tesla is developing a large long distance truck with a range of 1000km, which will be released in 2020.

3.6. Straddle carriers: probably the answer is battery electric with swappable batteries if they need to run 24 hours a day.

3.7. Aircraft: smaller aircraft are already going battery electric. In Vancouver there is a company converting their float planes to electric. Air New Zealand is expecting to have battery electric aircraft within the next few years, but long range large aircraft are a problem. Hydrogen plane prototypes have been around for many years, but still haven't become mainstream. According to some sources hydrogen is unsuitable for large passenger planes. In any case, this technology would need to be developed overseas. I actually think that ethanol produced from biomass could be the answer here – CO2 is produced, but at least the net result is zero, and it can be mixed with existing fuels. Air New Zealand has already trialled using a biofuel.

3.8. Ships: Once again hydrogen has been trialled, but yet to see anything significant. Battery electric is already being used for passenger ferries in Europe. I'm not sure what the complete answer here, but no large vessels are built in New Zealand, so this is not a problem we can solve.

4. Battery Electric Vehicles

For transport the clean alternative is battery electric vehicles (BEVs). This technology is available now and is way cheaper, very simple and cheap to maintain, and can be refilled literally anywhere. The one issue with range has been completely overcome with the current BEVs offering nearly 500km range, with a network of fast charging stations in place when people need more than overnight charging.

The problem with BEVs for car manufacturers and oil companies is that their adoption destroys their comfortable model of supply, distribution and servicing of cars and fuel. It is these companies who see the promotion of hydrogen as a way to maintain this system. With the adoption of BEVs, these companies are seriously concerned about their survival, despite the damage that the internal combustion engine is doing to us and the planet.

My own cynical opinion is that car manufacturers don't even expect to see many hydrogen vehicles any time soon, with their main intention to slow down the adoption of BEV's. I'm hoping that this paper has not been prompted by these same parties. Meanwhile green targets seem to have been diluted and introduction of incentives to reform the transport fleet have been delayed. I can't verify it's accuracy, but one figure I saw recently was that over 500 fossil fuel cars were introduced to the government fleet over the past year, and only 5 electric cars.

David Reid 24/10/19

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BE(Civil), CMEngNZ, CPEng