

[REDACTED]

From: no-reply@mbie.govt.nz
Sent: Monday, 2 September 2019 4:50 p.m.
To: [REDACTED]; Hydrogen
Subject: Hydrogen green paper - submission

Submission on Hydrogen green paper received:

Introduction

Name

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Email

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Business name or organisation (if applicable):

University of Canterbury

Position title (if applicable):

Sr. Lecturer-Chemical and Process Engineering

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?

Other than funding research, none. Government is always the investor of last resort. If an economic case can be made, the private sector will fund its development.

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

- 1) Gas which must be compressed.
- 2) The net energy in to create it is the same as the net energy you get back out to burn it, which makes it a perpetual motion machine.
- 3) Inherent volatility leads to explosion hazard much greater than liquid fuels.

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

- 1) no CO2 when generated from water or combusted.

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

Fund basic research into alternative methods of production and storage.

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

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

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

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

You can't fill up easily since it requires cylinder changes. Heat of compression requires a slow refill process, which is not conducive to mobile uses.

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

Only advantage is replacing fossil fuels and lower CO2. However, it also creates a potential atmospheric humidity issue if full replacement is envisioned to get the same energy yield.

Transportation only accounts for 10% of world energy use. Refrigeration of foods accounts for more (15%).

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

None.

What are the challenges for using hydrogen in industrial processes?

Compressed Storage, safe transport, retrofit of existing capital to use it.

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

Synthetic redox potential is huge if hydrogen was cheaper, but not an economic alternative to fossil fuels.

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

Perhaps CO2 emission tax if the revenues are used to actually sequester CO2.

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

the combustion product (water at near 100% relative humidity) creates a corrosion hazard for engines and exhausts.

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

Not even close to an economical substitution.

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

None. If it was economical the private sector would do it.

What are the challenges for hydrogen if produced for export?

How do you economically get it overseas and what is the sustainable point of difference for shipping H2 when it could be made locally?

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.

What are the opportunities for hydrogen if produced for export?

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

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