

[REDACTED]

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**From:** no-reply@mbie.govt.nz  
**Sent:** Tuesday, 3 September 2019 9:31 a.m.  
**To:** [REDACTED]; Hydrogen  
**Subject:** Hydrogen green paper - submission

Submission on Hydrogen green paper received:

## **Introduction**

### **Name**

[REDACTED]

### **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?**

Since the government is entrusted with protecting the clean green life of citizens as a top priority, and also the nations environment - so therefore ensuring the safe development, storage, and distribution of hydrogen without mishaps, is their role.

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

The production end is highly pollutant.

Although the process uses natural gas, production creates a great deal of CO2.

Hydrogen leakage can occur during many steps of its production and use.

A fuel cell car powered by hydrogen made with electricity uses three to four times more energy than a car powered by batteries.

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

Two possibilities that researchers are pursuing to salvage hydrogen as an environment-friendly fuel are as follows. Argonne National Lab is studying CO2 capture during the steam methane reforming process. And researchers in Australia are working on a solar-driven residential hydrogen pump-- creating hydrogen fuel by hydrolysis using photovoltaics on one's own garage roof.

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

Protecting the clean green life of citizens as a top priority and as a result - the nations environment - so therefore ensuring the safe development of electricity and hydrogen without mishaps.

Choosing the most sustainable method of producing hydrogen is critical:

- (1) reforming of natural gas to hydrogen,
- (2) conversion of coal to hydrogen,
- (3) use of nuclear energy to produce hydrogen,
- (4) electrolysis,
- (5) use of wind energy to produce hydrogen,
- (6) production of hydrogen from biomass
- (7) production of hydrogen from solar energy.

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

The separation of hydrogen and oxygen by hydrolysis (using Electricity) is much less popular than steam methane reforming because it is so inefficient; only about 70 percent. According to the documentary “Who Killed the Electric Car?” a fuel cell car powered by hydrogen made with electricity uses three to four times more energy than a car powered by batteries. This difference is expected to widen as battery technology continues to improve.

In the initial stage the electricity production may be from fossil resources.

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

Long-time investments in hydrogen technologies with electricity integration will become more and more attractive thanks to the lowering cost.

It is becoming an economically attractive solution in parts of the world where gas prices are high and electricity prices are low.

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

Protecting the clean green life of citizens as a top priority and as a result - the nations environment - so therefore ensuring the safe development, storage, and distribution of hydrogen for use in the transport sector without mishaps.

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

Although the process uses natural gas, production creates a great deal of CO<sub>2</sub>.

Hydrogen leakage can occur during many steps of its production and use.

Choosing the most sustainable method of producing hydrogen is critical:

- (1) reforming of natural gas to hydrogen,
- (2) conversion of coal to hydrogen,
- (3) use of nuclear energy to produce hydrogen,
- (4) electrolysis,
- (5) use of wind energy to produce hydrogen,
- (6) production of hydrogen from biomass
- (7) production of hydrogen from solar energy.

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

Choosing the most sustainable method of producing hydrogen is critical:

- (1) reforming of natural gas to hydrogen,
- (2) conversion of coal to hydrogen,
- (3) use of nuclear energy to produce hydrogen,
- (4) electrolysis,
- (5) use of wind energy to produce hydrogen,
- (6) production of hydrogen from biomass
- (7) production of hydrogen from solar energy.

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

Protecting the clean green life of citizens as a top priority and as a result - the nations environment - so therefore ensuring the safe development, storage, and distribution of hydrogen without mishaps.

Choosing the most sustainable method of producing hydrogen is critical:

- (1) reforming of natural gas to hydrogen,
- (2) conversion of coal to hydrogen,
- (3) use of nuclear energy to produce hydrogen,
- (4) electrolysis,
- (5) use of wind energy to produce hydrogen,
- (6) production of hydrogen from biomass
- (7) production of hydrogen from solar energy.

### **What are the challenges for using hydrogen in industrial processes?**

Although the process uses natural gas, production creates a great deal of CO<sub>2</sub>. Hydrogen leakage can occur during many steps of its production and use.

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

Choosing the most sustainable method of producing hydrogen is critical:

- (1) reforming of natural gas to hydrogen,
- (2) conversion of coal to hydrogen,
- (3) use of nuclear energy to produce hydrogen,
- (4) electrolysis,
- (5) use of wind energy to produce hydrogen,
- (6) production of hydrogen from biomass
- (7) production of hydrogen from solar energy.

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

Protecting the clean green life of citizens as a top priority and as a result - the nations environment - so therefore ensuring the safe development, storage, and distribution of hydrogen without mishaps.

Choosing the most sustainable method of producing hydrogen is critical:

- (1) reforming of natural gas to hydrogen,
- (2) conversion of coal to hydrogen,
- (3) use of nuclear energy to produce hydrogen,
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- (5) use of wind energy to produce hydrogen,
- (6) production of hydrogen from biomass
- (7) production of hydrogen from solar energy.

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

Protecting the clean green life of citizens as a top priority and as a result - the nations environment - so therefore ensuring the safe development, storage, and distribution of hydrogen without mishaps.

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

Choosing the most sustainable method of producing hydrogen is critical:

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- (2) conversion of coal to hydrogen,
- (3) use of nuclear energy to produce hydrogen,
- (4) electrolysis,
- (5) use of wind energy to produce hydrogen,
- (6) production of hydrogen from biomass
- (7) production of hydrogen from solar energy.

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

Protecting the clean green life of citizens as a top priority and as a result - the nations environment - so therefore ensuring the safe development, storage, and distribution of hydrogen without mishaps.

Choosing the most sustainable method of producing hydrogen is critical:

- (1) reforming of natural gas to hydrogen,
- (2) conversion of coal to hydrogen,
- (3) use of nuclear energy to produce hydrogen,
- (4) electrolysis,
- (5) use of wind energy to produce hydrogen,
- (6) production of hydrogen from biomass
- (7) production of hydrogen from solar energy.

**What are the challenges for hydrogen if produced for export?**

Although the process uses natural gas, production creates a great deal of CO<sub>2</sub>. Hydrogen leakage can occur during many steps of its production and use.

**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.**

Using natural gas deposits on Maori land/tribal sites/anyone else's land....etc should be discussed with those persons in an ethical way with sufficient compensation and royalties given

**What are the opportunities for hydrogen if produced for export?**

Long-time investments in hydrogen technologies with electricity integration will become more and more attractive thanks to the lowering cost.

It is becoming an economically attractive solution in parts of the world where gas prices are high and electricity prices are low.

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

**Use and release of information**

**We intend to upload submissions to our website at [www.mbie.govt.nz](http://www.mbie.govt.nz). Can we include your submission on the website?**

Yes

**Can we include your name?**

No

**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:**