

## Prepared by the New Zealand Embassy in Tokyo

### Summary

- In March 2019 the Government of Japan released its third Strategic Roadmap for Hydrogen and Fuel Cells. Japan considers its domestic uptake of hydrogen as a viable way to increase its energy self-sufficiency; decarbonise its economy; increase industrial competitiveness; and position Japan as a fuel cell technology exporter.
- At this stage, Japan is prioritizing the reduction of the production cost of hydrogen. The key consideration for large-scale uptake of hydrogen in Japan will be cost, and Japan is pursuing hydrogen produced using fossil fuels and utilising carbon, capture and storage (CCS) technology which is currently more economically competitive.
- Japan is looking for international cooperation to build a hydrogen supply chain, increase the scale of production, and reduce costs. Japanese companies continue to actively seek engaged international partners to undertake demonstration projects that deliver tangible results which presents an opportunity for New Zealand with its renewable energy credentials, and the New Zealand Government's strong support for hydrogen.
- Japan is interested in importing green hydrogen if the price is competitive, and two Japanese companies have invested in, or are looking to invest in, green hydrogen projects in New Zealand.

### Report

Japan's Prime Minister, Yoshihide Suga, recently announced that Japan will aim to achieve net zero greenhouse gas emissions by 2050. To decarbonise its economy, Japan is increasingly looking to future fuels such as hydrogen and innovative technology.

The Government of Japan released the third version of its Strategic Roadmap for Hydrogen and Fuel Cells in March 2019. The Roadmap can be viewed [here](#), the full version of the Hydrogen Strategy can be found [here](#).

The timeframes in Japan's Hydrogen Roadmap for realising a hydrogen economy are:

- technologically demonstrating the feasibility of storing and transporting hydrogen from abroad by 2022;
- introducing full-scale hydrogen generation by around 2030; and
- realising full-fledged domestic use of carbon dioxide-free hydrogen by around 2050.

Japan's Hydrogen Roadmap has an ambitious goal of:

- 40,000 fuel cell vehicles by 2020; 200,000 fuel cell vehicles by 2025; and 800,000 by 2030;
- 320 hydrogen refuelling stations by 2025; and 900 by 2030; and
- 1,200 fuel cell buses by 2030.

In Japan there are currently:

- 3,800 fuel cell vehicles;
  - 135 hydrogen refuelling stations;
  - 91 fuel cell buses; and
  - 250 fuel cell forklifts.
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Japan's Ministry for the Environment (MfE) is funding the following eight hydrogen demonstration projects throughout Japan:

1. A hydrogen refuelling station for fuel cell forklifts
2. Hydrogen produced from biogas originating from livestock manure to power fuel cell vehicles and fuel cell forklifts
3. Using hydrogen by-product to supply electricity to a swimming pool
4. A hotel powered by a hydrogen fuel cell
5. Hydrogen produced from hydro power used to heat a swimming pool
6. Green hydrogen used to power and heat a store
7. Mixing renewable hydrogen with town gas and used in stoves and other gas devices
8. Hydrogen produced using wind power used to generate electricity and heat at a hot spring facility

More information about the eight projects can be found [here](#). Through these projects, MfE is seeking to create a small hydrogen consortium for each region.

The Japanese Government's Hydrogen Roadmap has a goal of bringing the cost of hydrogen down to USD3 per kilogram by 2030, and USD2 per kilogram by 2050. Japan considers three conditions are necessary for realising affordable hydrogen:

*Supply:* (1) inexpensive feedstock; (2) large scale hydrogen supply chains

*Demand:* (3) large scale uptake in hydrogen usage in transport, power generation, and industrial processes where electrification is difficult

### **Japanese Government investment in hydrogen**

The total government budgetary support for hydrogen for this financial year (ending March 2021) is 70 billion yen (approximately NZD 1 billion) (Note: This figure was corrected from the 700 billion yen figure used when this report was originally published) and includes:

- subsidies for fuel cell vehicles;
- subsidies for hydrogen refuelling stations;
- research and development on fuel cell technologies,
- hydrogen supply infrastructure,
- international research collaboration projects for innovative technologies in clean energy (for example CCS);
- pilot projects to develop the hydrogen supply chain; and
- technology development to produce, store and utilise hydrogen.

In January 2020 the Japan Bank for International Cooperation (JBIC) designated hydrogen as an "essential resource", unlocking more government funding for hydrogen projects (covering the entire supply chain including production, transportation, supply and utilization) to be undertaken in developed countries.

Japan was planning to use the 2020 Olympic and Paralympic Games as a platform to promote its hydrogen technology by using fuel cell vehicles and buses, and powering the athletes' village with hydrogen. Japan may consider showcasing a scaled down version of its hydrogen technology at the Olympic and Paralympic Games postponed to 2021.

Japan considers Expo 2025 in Osaka as another opportunity to showcase Japan's hydrogen technology and share its plans for a hydrogen economy.

Japan is also considering ammonia as a potential fuel to decarbonise its economy. Japan is also actively considering ammonia as a viable fuel to:

- decarbonise the maritime industry;
- transport hydrogen; and
- store energy.

An industry group called the [Green Ammonia Consortium](#) operates in Japan which is working to build an international supply chain for ammonia as a way to decarbonise economies.

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## **Intersection with New Zealand's interests**

The Governments of Japan and New Zealand signed a Memorandum of Cooperation on green hydrogen in 2018. The Memorandum seeks to encourage industry and research institutes to collaborate in the field of hydrogen. So far two Japanese companies have invested in, or are looking to invest in, green hydrogen projects in New Zealand.

Japan is looking for international cooperation to build a hydrogen supply chain, increase the scale of production, and reduce costs. Japanese companies continue to actively seek engaged international partners to undertake demonstration projects that deliver tangible results. New Zealand's renewable energy credentials position New Zealand well to cooperate in joint research and pilot projects with Japan; and to supply Japan with green hydrogen in future.

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