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# Japan: hydrogen strategy

MARKET INTELLIGENCE REPORT

# Summary

*Prepared by the New Zealand Embassy in Tokyo.*

- Japan released a revised Hydrogen Basic Strategy in June 2023, motivated by G7 commitments to move away from a reliance on Russian energy and growing calls for climate action, as well as a rapidly changing global energy and policy landscape.
- The strategy identifies core strategic areas which Japan views as critical to securing its industrial competitiveness in global hydrogen – including through the commercialisation of Japan-developed hydrogen-related technology such as electrolysers.
- The Japanese government and Japanese corporations are seeking international partners to build a hydrogen supply chain, increase the scale of production of hydrogen and ammonia, and reduce costs.
- New Zealand's renewable energy credentials and home-grown R&D position New Zealand well to cooperate in joint research and pilot projects with Japan.

# Report

## The hydrogen strategy

Japan released a revised Hydrogen Basic Strategy in June 2023. Japan was motivated by G7 commitments to move away from a reliance on Russian energy, growing calls for climate action, and new hydrogen subsidies under the EU's Green Deal Industrial Plan and the US' Inflation Reduction Act.

Japan's first strategy, released in December 2017, was the world's first national hydrogen strategy; however, the energy landscape has changed drastically since then. Japan's revised strategy intends to generate public and private sector investment in hydrogen worth 15 trillion yen (NZD173.4bn<sup>[1]</sup>) over the next 15 years, and increase the use of hydrogen six fold by 2040.

Japanese government officials highlighted three new features of the refreshed strategy:

- a new mid-term volume target of 12 million tonnes per annum by 2040 (a six fold increase from current levels);
- a “pathway” to low-carbon hydrogen – aiming for 3.4kg of CO<sub>2</sub> emissions or less for 1kg of hydrogen produced;
- a 10% target for Japanese companies' share of the global electrolyser market.

Japanese government officials also highlighted support schemes to be implemented under the new strategy: 1) **cluster development support** to establish internationally competitive industrial clusters and supply chains (1 trillion yen/NZD11.5bn<sup>1</sup> of public and private investment expected) and 2) a **producer support scheme** with a view to expanding the supply volume and reducing supply cost (more than 7 trillion yen/NZD80.9bn<sup>1</sup> investment expected). Japan's Ministry of Economy, Trade and Industry (METI) expects to release information on a more detailed scheme by March 2024.

At a press conference, Minister of Economy, Trade and Industry NISHIMURA Yasutoshi said “We would like to steadily build a supply chain for hydrogen in Asia and the Indo-Pacific region by further expanding Japan's (hydrogen) technology, which has been world-leading.” In order to promote Japan's policy toward hydrogen and ammonia, the Ministry of Economy, Trade and Industry (METI) established a new division for hydrogen and ammonia policy separately from its hydrogen and fuel cells strategy office in July 2023.

[1] Calculated with exchange rate @ NZD1=86.5JPY

Below is a table summarising some of the targets that have been set out in the revised strategy. The full strategy in Japanese is available [here](#), and in English [here](#). A provisional translation is available [here](#).

Targets	Current	Revised Hydrogen Strategy - June 2023
Volume (use)	2 Mt/pa	3 Mt/pa by 2030 12 Mt/pa by 2040* 20 Mt/pa by 2050 <i>*New additional mid-term target</i>
Volume (domestic production)	2 Mt/pa	No numeric target
Volume (imports)	-	No numeric target, but assumes large volume of supply to be via import
Electrolyser capacity	-	By 2030, 15 GW of water electrolysers to be installed by Japanese-related companies (including sub-material manufacturers) globally
Low-carbon intensity	-	Hydrogen: 3.4kg-CO2e/kg-H2 (well-to-gate) Ammonia: 0.84kg-CO2e/kg-NH3 (gate-to-gate)
Price efficiency	100 yen/Nm3	30 yen/Nm3 by 2030 20 yen/Nm3 by 2050
Refuelling stations	180	1,000 by 2030
FCV uptake	7,700+	Equivalent 800,000 passenger vehicles by 2030 (no separate targets for e.g. buses)
Co-firing %[2]	Hydrogen: 30% Ammonia: 20%	Hydrogen: 30%+ (demonstration) by 2030 Ammonia: 20%+ (commercial) by 2030 (dependent on size) Longer term aspirations of 50%.
Installed home fuel cells	-	3 million by 2030
CCS storage capacity	-	between 6-12 million tonnes annually by 2030

[1] Hydrogen and ammonia are expected to make up 1% of Japan's primary energy mix by 2030 according to the government's sixth energy plan, specified as largely through co-firing.

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## What are Japan's focus areas for hydrogen?

In the revised strategy, the Japanese government identifies the following five categories (nine areas) as core strategic areas. These areas were chosen on the basis that 1) the market is relatively fast-growing and is sufficiently large in size, and 2) there are perceived technological advantages of Japanese companies in these areas.

- Hydrogen supply (hydrogen production, construction of hydrogen supply chain)
- Decarbonised power generation
- Fuel cells
- Direct use of hydrogen (decarbonised steel, decarbonised chemicals, hydrogen-fuelled vessels)
- Utilisation of hydrogen compounds (fuel ammonia, carbon recycling products)

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

The new hydrogen strategy also makes it clear that the Japanese government will subsidise the establishment of the hydrogen supply chain and the development of infrastructure based on "carbon intensity." This means that the Japanese government will subsidise projects based on the threshold of clean hydrogen according to carbon intensity rather than "colour" of hydrogen. The [threshold](#) of clean hydrogen is defined as 3.4 kg of CO<sub>2</sub> emissions per kg of hydrogen on a Well-to-Gate basis. The threshold for ammonia is defined as 0.84 kg of CO<sub>2</sub> emissions per kg of ammonia on a Gate-to-Gate basis.

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## Hydrogen Energy Ministerial Meeting

Japan held its annual [Hydrogen Energy Ministerial Meeting](#) on 25 September 2023, as part of its [GX \(Green Transformation\) Week](#). Representatives from more than 20 countries and organisations attended. New Zealand was represented by the New Zealand Ambassador to Japan. The Chair's Summary is available to read online [here](#).

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## Opportunities for New Zealand businesses

New Zealand and Japan are working together to help meet our respective goals of net carbon neutrality by 2050. The Governments of Japan and New Zealand signed a Memorandum of Cooperation on hydrogen in 2018. The New Zealand Hydrogen Council and Japan Hydrogen Association signed a Memorandum of Understanding in 2022. Both memoranda seek to encourage cooperation between the two countries, and in particular,

industry and research institutes to collaborate in the field of hydrogen.

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

Collaboration is already occurring. Obayashi Corporation has a joint venture, Halcyon Power, with Tuaropaki Trust. Mitsui & Co. is working with New Zealand companies on green hydrogen projects in New Zealand. Japanese companies are also investing in New Zealand technology. In early 2023 Obayashi Corporation made a joint investment in AFCryo Global Limited (AFGL), the holding company of Fabrum Solutions Limited (Fabrum), which develops hydrogen-related equipment in New Zealand, along with AP Ventures, a UK venture capital firm, and Fortescue Future Industries.

Upcoming hydrogen industry and research events will provide plenty of further opportunities for collaboration:

- 19-21 Nov, Christchurch | [Japan New Zealand Business Council Conference](#)
- 31 Jan – 2 Feb 2024, New Zealand | [New Zealand Hydrogen Symposium 2024](#)
- 3-5 Jun 2024, Japan | [Japan Energy Summit and Exhibition 2024](#)

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## External links

[Chairman's Message - The Institute of Energy Economics, Japan - IEEJ](#)

[A Look at Japan's Latest Hydrogen Strategy – The Diplomat](#)

[Japan's Sixth Strategic Energy Plan – Oct 2021 \(provisional translation\)](#)

[NZ Hydrogen Projects – New Zealand Hydrogen Council](#)

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## References

[Obayashi Corporation Invests in AFCryo Global Limited, a New Zealand Venture](#)

[Developing Hydrogen Equipment Using Cryogenic Separation Technology | News | Obayashi Global](#)

[Fabrum to supply Obayashi Corporation with a 1MW hydrogen refuelling station in Auckland - Fabrum](#)

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