

Development of Green Transformation (GX) Regulations in Japan — Introduction of Japan's Emissions Trading System

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I Introduction¹

In 2024, Japan made significant progress toward the establishment of a fundamental regulatory framework to promote the carbon dioxide capture and storage (CCS) industry and the hydrogen and ammonia industry. In May 2024, the Japanese Diet (parliament) passed two pieces of legislation: the Carbon Dioxide Storage Business Act ('**CCS Business Act**') and the Act on Promoting the Supply and Utilisation of Low-Carbon Hydrogen, Etc, for a Smooth Transition to a Decarbonised Growth Economic Structure ('**Hydrogen Society Promotion Act**').

The CCS Business Act is principally a domestic law, and governs the conduct of CCS activities within the territory of Japan; it covers exploration and prospecting for reservoirs, storing CO₂ in reservoirs, and pipeline transport of CO₂ for storage of CO₂ in reservoirs (including reservoirs in foreign countries). The Hydrogen Society Promotion Act establishes a plan certification system for low-carbon hydrogen/ammonia supply and use projects, provides support measures and special regulatory measures for hydrogen/ammonia supply or use businesses that have received plan certification, and takes other measures to expand the supply and demand of low-carbon hydrogen/ammonia.

Following on these developments, 2025 has marked a significant milestone in Japan's decarbonisation efforts. In May 2025, the Japanese Diet passed a bill amending the Act on the Promotion of a Smooth Transition to a Decarbonised Growth-Oriented Economic Structure ('**GX Promotion Act**'). The GX Promotion Act was originally enacted in 2023, with the goal of achieving carbon neutrality by 2050 while maintaining economic growth. This recent amendment further solidifies the legal framework for Japan's Green Transformation (GX) strategy, by establishing a legal framework for Japan's Emissions Trading System (ETS), with the goal of full-scale implementation during the 2026 fiscal year.

This newsletter provides an overview of recent developments in Japan's GX regulations leading up to the full-scale implementation of Japan's ETS.

II Background — Leading Up to Full-Scale Implementation of Japan's ETS

The Paris Agreement requires all contracting states to submit and update their greenhouse gas emissions

¹ This newsletter is based on the manuscript for a presentation originally delivered by the authors at ADIPEC in November 2024, which has been updated to reflect subsequent developments.



reduction targets, as Nationally Determined Contributions ('NDC'), every five years. The NDC Japan submitted to the UNFCCC Secretariat in October 2021 aimed to reduce greenhouse gas emissions by 46% by 2030, compared to 2013 figures, as part of a consistent and ambitious goal of achieving carbon neutrality by 2050, and Japan continues to strive for the even higher goal of a 50% reduction by FY2030.

1. CCS Policy Development in Japan

Since submission of the NDC in October 2021, the Ministry of Economy, Trade, and Industry of Japan ('METI') has accelerated policy measures to realise the commercialisation of CCS projects. In January 2022, the METI's Agency for Natural Resources and Energy organised a CCS Long-term Roadmap Study Group, which summarised and published the CCS Long-term Roadmap in March 2023.

In June 2024, the Japan Organization for Metals and Energy Security ('JOGMEC') selected nine 'Advanced CCS Projects', which plan to commence operations by 2030, to receive financial support as part of a project by METI to establish business models. Of the nine Advanced CCS Projects, five are planned to involve domestic storage and four will utilise overseas storage.

In June 2025, METI published a policy framework that outlines the next phase of support for CCS projects involving domestic pipeline transport. This builds upon earlier support for advanced CCS projects and reflects Japan's commitment to scaling up CCS deployment.

The regulatory measures include enactment of the CCS Business Act and the Japanese Diet's approval of acceptance of the 2009 Amendment to the London Protocol (i.e., the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter) in May 2024, as discussed in further detail below.

2. Hydrogen/Ammonia Policy Development in Japan

The Japanese government adopted the Hydrogen Basic Strategy in December 2017. Since then, additional measures have been taken; for example, the Green Innovation Fund (a fund through which the Japanese government allocated 2 trillion yen (nearly 3 trillion yen as of the end of July 2023) to the New Energy and Industrial Technology Development Organization (NEDO) to support R&D projects by private companies in various fields, including CCS and hydrogen/ammonia) was established in spring of 2021, to provide about 800 billion yen for research and development and for demonstration projects relating to hydrogen/ammonia.

Building on these developments, the enactment of the Hydrogen Society Promotion Act in May 2024 marked a significant step forward in the advancement of hydrogen and ammonia initiatives. The Act introduces both financial and regulatory support, with approximately 3 trillion yen in funding expected over the next 15 years, to develop robust supply chains.

3. GX Policy Development and Introduction of Japan's ETS

These CCS and hydrogen/ammonia policy developments are occurring in parallel with Japan's overarching GX policy. In May 2023, the Japanese government enacted the GX Promotion Act and, based on this Act, approved

the ‘Strategy for Promoting the Transition to a Decarbonised Growth-Oriented Economic Structure’ (GX Promotion Strategy) by Cabinet decision, thereby concretising new policies, such as the ‘Growth-Oriented Carbon Pricing Framework.’ As part of these efforts, Japan launched a voluntary emissions trading system in April 2023.

Subsequently, in February 2024, the GX Promotion Strategy was revised and the ‘GX 2040 Vision’ was formulated and approved by the Cabinet, to enhance predictability for GX investments. The GX 2040 Vision consists of eight parts: Introduction; GX Industrial Structure; GX Industrial Location; the Importance of a Realistic Transition and Contribution to Global Decarbonisation; Initiatives in Individual Sectors, Including the Energy Sector, to Accelerate GX; Growth-Oriented Carbon Pricing Framework; Fair Transition; and Progress and Review of Policy Implementation.

In February 2025, by Cabinet decision, the Japanese government approved ambitious targets aligned with the 1.5°C goal: to reduce greenhouse gas emissions by 60% by FY2035 and by 73% by FY2040 (in both cases, compared with FY2013 levels). On the same day, these targets were submitted to the UNFCCC Secretariat as Japan’s NDCs for FY2035 and FY2040.

In May 2025, the GX Promotion Act was amended to transform the emissions trading system, which began in 2023 on a voluntary basis, into a legally binding compliance mechanism, as discussed in further detail below.

III The CCS Business Act and the Hydrogen Society Promotion Act

1. The CCS Business Act

The CCS Business Act regulates the following businesses, when carried out in Japanese territory: (i) exploration of reservoirs, including saline aquifers and depleted oil and gas fields, without excavation; (ii) exploration of reservoirs with excavation; (iii) storing CO₂ in reservoirs; and (iv) pipeline transport of CO₂ for purposes of CCS. Capturing CO₂, transport of CO₂ by ship or vehicle, and carbon dioxide capture and utilisation (CCU) activities generally are not covered by the CCS Business Act.

The act focuses primarily on the CO₂ storage business; specifically, the act establishes a licensing system for CO₂ storage businesses, establishes the right to store CO₂ in reservoirs, obligates storage operators to take necessary measures to ensure public safety, and allows storage operators to transfer monitoring and other management operations to the JOGMEC after storage under certain conditions.

(1) Regulations addressing the pipeline transport of CO₂ for purposes of CCS

The pipeline transport of CO₂ from the CO₂ capture site to the loading port in connection with a cross-border CCS project is covered and regulated by the CCS Business Act. The following table provides a brief summary of the regulations applicable to the pipeline transport of CO₂ for CCS purposes.

Item	Summary
Application	A legal entity that intends to commence the business of pipeline transport of CO ₂ for CCS purposes must file an application with the minister of METI. The legal entity that files the application becomes the pipeline transport operator (‘Pipeline

	Transport Operator’).
Measurement of CO ₂	A Pipeline Transport Operator must measure the flow rate and pressure of CO ₂ to be transported and other matters specified by METI ordinance, record the results thereof, and preserve the records.
Maintenance	Generally, a Pipeline Transport Operator is obligated to take necessary measures to maintain public safety and prevent the occurrence of disasters (e.g., pipeline ruptures, leakages of CO ₂ from transport facilities). Moreover, a Pipeline Transport Operator must maintain its pipeline transport facilities in conformity with the technical standards established by the relevant METI ordinance.
Third party access	The CCS Business Act requires a Pipeline Transport Operator that provides pipeline transport services to third parties to establish general terms and conditions for the service of pipeline transport of CO ₂ for CCS purposes, in accordance with the METI ordinance, and file these provisions with the minister of METI.

(2) Acceptance of the 2009 Amendment to the London Protocol

Article 6 of the London Protocol has prohibited Japan from exporting CO₂ to other countries for dumping at sea, which has been a significant legal obstacle for CCS projects seeking to store CO₂ recovered in Japan in sub-seabed geological formations overseas. The 2009 Amendment to the London Protocol added new Article 6.2, which allows for export of CO₂ under certain conditions. Although the 2009 Amendment has not become effective yet, Japan can apply the amendment by announcing the provisional application upon or after deposit of Japan’s acceptance of the amendment, in accordance with the resolution of the conference of contracting parties to the London Protocol adopted in October 2019.

With this in mind, during the same session at which the CCS Business Act was passed, the Japanese Diet approved the 2009 Amendment to the London Protocol to allow the export of CO₂ for sub-seabed geological sequestration overseas.

The government is preparing the necessary regulations to establish the export authorisation system required to implement Article 6.2 of the amended London Protocol. Under the Foreign Exchange and Foreign Trade Act, METI has the authority to require the exporters of certain types of goods to obtain approval under cabinet orders, to the extent necessary for faithful implementation of treaties and other international commitments. After the Diet’s approval of the 2009 Amendment to the London Protocol, METI decided to introduce domestic measures to implement this amendment by adding gases containing carbon dioxide exported for the purpose of ‘disposal’, as defined in the London Protocol, to the goods listed in the Export Trade Control Order (the subordinate cabinet order of the Foreign Exchange and Foreign Trade Act) that require METI’s approval for export. It is expected that this amendment to the Export Trade Control Order will be adopted soon. It also will be necessary to conclude bilateral agreements or arrangements with the country or countries to which CO₂ will be exported for sub-seabed geological sequestration, in accordance with Article 6.2 of the London Protocol.

(3) Implementation of the CCS Business Act

The provisions of the CCS Business Act will enter into force on a sequential basis, with different effective dates for the provisions governing exploration of reservoirs (August 2024) and prospecting reservoirs (November 2024); the provisions governing storage of CO₂ in reservoirs, and other provisions, such as pipeline transport of CO₂, will enter into force within two years of promulgation (circa May 2026). METI is advancing discussions in subcommittees established under METI to develop METI ordinances and other necessary instruments in

preparation for the entry into force of the provisions for storing CO₂ in reservoirs and pipeline transport of CO₂.

2. The Hydrogen Society Promotion Act

(1) Purpose and Definition of 'Low-carbon hydrogen, etc.'

The purpose of the Hydrogen Society Promotion Act is to promote the supply and use of 'low-carbon hydrogen, etc.' at an early stage.

The Hydrogen Society Promotion Act defines 'low-carbon hydrogen, etc.', as hydrogen and its compounds, as specified in a METI ordinance, that meet(s) the following criteria: the amount of CO₂ emitted from its production is less than a certain level, and it meets the requirements set forth in the METI ordinance, for example, that its use contributes to the reduction of CO₂ emissions in Japan, in light of international decisions regarding the calculation of CO₂ emissions.

The METI ordinance adopts the following definition of 'low-carbon hydrogen, etc.' ('low-carbon hydrogen/ammonia'):

- i. Hydrogen: the amount of carbon dioxide emitted from the production of one kilogram of hydrogen must be 3.4 kilograms or less; and
- ii. Ammonia: the amount of carbon dioxide emitted from the production of one kilogram of ammonia must be 0.87 kilograms or less; and
- iii. Synthetic fuel: the amount of carbon dioxide emitted from the production, transport, storage, and use of one megajoule of heat value of synthetic fuel, after deducting some or all of the amount of carbon dioxide captured for use as a feedstock for synthetic fuel, must be 39.9 grams or less; and
- iv. Synthetic methane: the amount of carbon dioxide emitted from the production, liquefaction, transport, storage, and use of one megajoule of heat value of synthetic methane, after deducting some or all of the amount of carbon dioxide captured for use as a feedstock for synthetic methane, must be 49.3 grams or less.

The Hydrogen Society Promotion Act can apply to low-carbon hydrogen/ammonia procurement from abroad by Japanese users, when the relevant requirements are met.

(2) Plan certification system

The Hydrogen Society Promotion Act establishes a plan certification system for low-carbon hydrogen/ammonia supply businesses and low-carbon hydrogen/ammonia use businesses.

Business operators that produce, import, and supply low-carbon hydrogen/ammonia in Japan ('LC H₂/NH₃ Supplier'), and business operators that use low-carbon hydrogen/ammonia as energy and raw materials in Japan ('LC H₂/NH₃ User'), prepare plans jointly or independently and submit them to the competent minister (Minister of METI and/or Minister of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT)).

If a low-carbon hydrogen/ammonia supply or use plan is certified, the certified LC H₂/NH₃ Supplier or User

may apply for Support Focusing on Price Differentials (where subsidies will be provided by JOGMEC for the LC H₂/NH₃ Suppliers to continuously supply low-carbon hydrogen/ammonia in accordance with the certified plan) and Support for the Development of Bases (where subsidies will be provided by JOGMEC for the development and maintenance of shared facilities for storage, transfer, and other activities with regard to low-carbon hydrogen/ammonia that are necessary for implementation of the certified plan).

(3) Implementation of the Hydrogen Society Promotion Act

The Hydrogen Society Promotion Act was enacted in October 2024, and on 30 September 2025, two projects were officially certified under the scheme. METI are continuing the review process, and additional projects are expected to be certified in the near future.

IV The GX Promotion Act

The GX Promotion Act, which was enacted in 2023, introduced various measures, such as formulation and implementation of the GX Promotion Strategy, issuance of GX Transition Bonds, introduction of a Growth-Oriented Carbon Pricing Framework, and establishment of the GX Promotion Organisation, with the aim of simultaneously achieving Japan's international commitment to carbon neutrality by 2050 while also strengthening industrial competitiveness and economic growth.

1. Amendment to the GX Promotion Act

The Japanese government has been advancing a Growth-Oriented Carbon Pricing Framework, which includes the development of a national voluntary Emissions Trading System, based on the GX Promotion Act. On 25 February 2025, a bill to amend the GX Promotion Act was approved by the Cabinet and submitted to the Diet. The Diet passed the bill on 28 May 2025, accelerating the legal and institutional groundwork for full-scale implementation of the ETS. The amendment introduces three major reforms:

Item	Summary
Legal Codification of the Emissions Trading System	Starting in FY2026, companies with annual direct CO ₂ emissions exceeding a threshold set by METI ordinance will be legally required to participate in the national ETS. Emissions allowances will be allocated free of charge, based on government guidelines that consider industry benchmarks, past reduction efforts, R&D investments, and international competitiveness. Companies must report verified emissions and surrender equivalent allowances annually. Failure to comply will result in financial penalties. To facilitate compliance and flexibility, a carbon market will be established, allowing entities to trade surplus or deficit allowances. The government also will introduce price stabilisation measures, including upper and lower price limits for emissions allowances.
Implementation of Fossil Fuel Levy Measures	Starting in FY2028, importers and producers of fossil fuels will be subject to a carbon levy based on the CO ₂ content of the fuels. To enforce the fossil fuel levy, the amendment provides for the development of technical rules, including payment deadlines, procedures for delinquent payments, and exemptions for fuels not used domestically. These measures aim to ensure the smooth and fair execution of the levy system.
Financial Support for GX Investments	Revenues from GX Transition Bonds will be used to offset tax reductions under the Strategic Domestic Production Promotion Tax System, particularly for GX-

related goods. This ensures stable funding for decarbonisation initiatives.

2. Overview of Japan's ETS

The following table provides a summary of Japan's ETS, as established under the GX Promotion Act.

Item	Summary
Target Entities	Entities subject to the ETS are those whose average annual direct CO ₂ emissions over the past three fiscal years exceed a threshold set by METI ordinance. This threshold is expected to be 100,000 tons of CO ₂ .
Emissions Reporting and Verification	Each fiscal year, covered entities must calculate their actual emissions, obtain third-party verification from a registered verification body, and report the verified emissions to the relevant government authorities. The methodology for calculating emissions will be based on existing frameworks, such as the Energy Conservation Act and the Global Warming Countermeasures Act.
Allocation and Retirement of Emissions Allowances	Entities must hold allowances equivalent to their reported emissions in their accounts by January 31 of each year. The government will retire these allowances from the entities' accounts on the same date. If an entity fails to hold sufficient allowances, it must pay a penalty fee, calculated as 1.1 times of the reference upper price limit per ton of CO ₂ .
Free Allocation of Allowances	The Minister of METI will allocate allowances at no cost based on each entity's emissions reduction targets and guidelines. It is anticipated that, under this full free allocation scheme, no burden will be imposed on the covered entities as long as they achieve the desirable level of emissions reductions, as set forth in the implementation guidelines. Paid auctions are scheduled to begin in FY2033, and power producers subject to these auctions will be required to purchase a portion of their emissions allowances and make specified contributions to the government in return.
Price Stabilisation Measures	To prevent excessive price volatility, if market prices exceed the reference upper price limit, entities may pay the equivalent amount to the government instead of procuring additional allowances. To support the lower price limit, the GX Promotion Organisation may conduct reverse auctions to purchase allowances. If prices remain low, the government may tighten allocation criteria to reduce supply.

3. Next Step for Japan's ETS

Currently, the Subcommittee on the Emissions Trading System, established under METI, is actively engaged in designing the detailed framework for the ETS, based on the amended GX Promotion Act. The subcommittee is deliberating on various technical aspects, including methods of calculating and verifying emissions, allocation guidelines and benchmarks, market operation and price stabilisation mechanisms, and compliance obligations and penalties.

One notable proposal under discussion is to allow covered entities to use carbon credits—specifically J-Credits and JCM Credits—to offset up to 10% of their annual emissions. This flexibility is intended to help companies meet their compliance obligations while promoting investment in emissions reduction projects.

V Conclusion

In order to achieve the CCS, ammonia, and hydrogen targets that contribute to Japan's NDC, it is increasingly



important to promote and advance cross-border CCS projects, whereby CO2 captured in Japan is exported to and geologically stored in a reservoir overseas, and low-carbon hydrogen and ammonia procurement projects, whereby low-carbon hydrogen and ammonia are produced overseas and imported into Japan.

The CCS Business Act and the Hydrogen Society Promotion Act, both enacted in 2024, have played a steady role in advancing Japan's CCS and hydrogen-ammonia industries. Japan's Emissions Trading System could become a key driver of the country's progress through the GX transition. Therefore, it is essential for companies that are interested in Japan's emerging GX market to follow the regulatory developments closely and understand the overall regulatory framework to ensure the success of various projects and efforts.

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