

CARBON CAPTURE AND STORAGE – HOW WILL JAPAN ESTABLISH CCS VALUE CHAINS?

To enable Japan to achieve its ambitious targets for the reduction of greenhouse gas emissions, the government has committed to support advanced carbon capture and storage (CCS) projects. The new CCS Business Act includes a licensing system for CCS businesses, marking a major step toward the practical application of CCS in Japan. This briefing provides an overview of the licensing and other requirements under the CCS Business Act and the current environment surrounding implementation of CCS value chains in Japan.

In October 2020, the government of Japan set a goal of reaching net zero greenhouse gas emissions by 2050. In April 2021, the government further declared that it aimed to reduce greenhouse gas emissions by 46% – as compared with FY2013 – by FY2030. To achieve these targets, the government announced in its "GX Promotion Strategy" that it would support advanced projects serving as role models for developing the business environment necessary for initiating CCS projects by 2030 and, in May 2024, the National Diet of Japan passed the Act on Carbon Dioxide Storage Business (Act No. 38 of 2024, the CCS Business Act) to establish the necessary legal environment for investment in CCS projects in Japan. As of 31 October 2024, the CCS Business Act had only partially been enacted and related ordinances of the Ministry of Economy, Trade and Industry (METI) and the Ministry of Environment (MOE) will need to be passed before the CCS Business Act can be fully enacted.

Implications of the CCS Business Act – Storage Businesses

Designated Areas

Under the CCS Business Act, it is contemplated that METI (with the consent of MOE, in the case of subsea reservoirs) will designate areas in which reservoirs are found or are likely to be found (Designated Areas) and will conduct a public tender pursuant to which licences for exploratory drilling and/or operating a carbon dioxide (CO₂) storage business will be granted to the winning bidder. Conducting exploratory drilling or operating a storage business without the relevant licence may result in criminal penalties. If an

operator intends to conduct exploratory drilling and/or operate a storage business in an area which is not a Designated Area, the CCS Business Act allows the operator to make a proposal to METI in accordance with the prescribed procedures, requesting that METI designate such area as a Designated Area.

Licences

An operator who wishes to conduct exploratory drilling and/or operate a storage business in a Designated Area will need to apply to METI in accordance with the relevant bid guidelines, detailing its plan for exploratory drilling and/or CO₂ storage. The application documents must include geological survey results, evidence of the operator's experience in CCS business, and financial statements. METI will review the submitted applications and may request additional information. Consultation with the MOE will also be conducted by METI to evaluate the environmental impact of subsea storage sites. Once the application is approved, METI will issue a licence for exploratory drilling and/or operation of a storage business.

Services to third parties

If a storage business operator plans to store CO₂ emitted by a third party, it will be required to: (i) prepare and publicise general terms and conditions applicable to its storage services, (ii) file such terms and conditions with METI and (iii) provide the storage services in accordance with those terms and conditions. The detailed requirements for such terms and conditions will be specified in the relevant ordinance. At this stage, the CCS Business Act only mandates that these terms and conditions must include an appropriate and transparent price formula for service charges and that the operator may not decline a third-party request for storage without valid reasons.

Safety measures and liability

Storage business operators must implement safety measures to ensure the security of the storage facilities in accordance with the requirements to be provided in the relevant ordinances, and they are also required to put into place internal safety regulations and notify the details of these to METI. Continuous monitoring to prevent CO₂ leakage is required, until the storage site is closed and the Japan Organisation for Metals and Energy Security (JOGMEC) takes over the storage rights from the operator.

The closure of a storage site requires the storage business operator to: (i) prepare a closure plan, (ii) obtain approval for the closure plan from METI, (iii) execute the closure of the site in accordance with the approved plan and (iv) have the site inspected by METI to ensure compliance with the technical requirements to be stipulated in the relevant ordinance. After the last storage of CO₂ at the site and following the period to be provided in the relevant ordinance, the storage business operator may, with the approval of METI (and MOE, in the case of subsea reservoirs), terminate the storage business and transfer the storage rights to JOGMEC. Thereafter, JOGMEC will assume responsibility for monitoring the site for any potential leakage.

The storage business operator is responsible for compensating landowners for any damage caused by storage activities. The operator is also liable for any damage caused by CO₂ leakage on a strict liability basis (i.e., even if it has not acted negligently), even after closure of the storage site and its transfer to JOGMEC. The approach of imposing strict liability on operators follows the

approach under the Mining Act (Act No. 289 of 1950), which imposes strict liability on holders of mining rights with respect to damage suffered as a result of the excavation of land, discharge of mine water or wastewater, deposits of waste rock or slag, or the discharge of metallurgical smoke.

Implications of the CCS Business Act – Pipeline Transportation Businesses

Notification

Transporting CO₂ through pipelines for the purpose of storage in sites located in or outside Japan will require prior notification to METI. The transporter is required to notify METI of, among other things, (i) its name and address, (ii) the location of the storage site, (iii) the name and address of the storage site operator, (iv) details of the pipelines (including where they will be installed) and (v) when it will start transporting CO₂.

Services to third parties

A transporter intending to transport CO₂ on behalf of third parties, will be required to (i) prepare and publicise general terms and conditions applicable to its transportation services, (ii) file such terms and conditions with METI and (iii) provide the transportation services in accordance with such terms and conditions. The detailed requirements for such terms and conditions will eventually be outlined in a METI ordinance. The CCS Business Act mandates transporters to comply with the same requirements as to pricing of service charges and third-party access as storage business operators (see above).

Safety measures

The transporter must implement safety measures to ensure public safety and to prevent accidents from occurring, and must maintain the transportation facilities appropriately so that they meet the technical requirements to be provided in the relevant METI ordinances. They are also required to put into place internal safety regulations and notify the details of these to METI.

Cross-border elements

While the licence and other requirements for a CO₂ storage business apply only to projects with storage sites within Japan's territory (including its territorial waters), the notification and other requirements for a pipeline transportation business also apply to projects with storage sites located outside the territory of Japan, to the extent such pipeline business transports any CO₂ in Japan.

Government's plan

The government is confident that Japan has all the requisite technologies to establish a CCS value chain (carbon capture, CO₂ transport and storage). Through implementation of the CCS Business Act, the government intends to establish CCS value chains and secure an annual CO₂ storage volume of 6 to 12 million metric tons per annum (Mtpa) in total (including storage sites outside Japan) by 2030.

The government intends to promote CCS projects with storage sites in Japan and outside of Japan by providing financial support. JOGMEC has selected nine advanced CCS projects to receive subsidies, including projects with storage sites located in Oceania and Malaysia. Although currently in the feasibility stage, these projects are expected to commence operation by 2030,

if successful. Once fully developed and operational, they are projected to provide an aggregate CO₂ storage capacity of 20 million metric tons per annum (Mtpa). JOGMEC is expected to continue providing financial support to these projects in each of the exploratory drilling, construction and operation phases.

In addition to these subsidies, JOGMEC will support and participate in selected CCS projects by way of subscribing for equity in project companies and/or providing guarantees for loans made to project companies by commercial banks. Investors in CCS projects that will store CO₂ originating from Japan may wish to consider utilising such support to enhance the economics of their projects.

What's next?

As can be seen from the content of the CCS Business Act (such as the obligation not to reject third-party requests for storage and transportation) and the actual and anticipated support provided by JOGMEC, the government is keen to establish both domestic and cross-border CCS value chains as one of the means of achieving carbon neutrality by 2050.

It is also no coincidence that the CCS Business Act was passed at the same time as the Hydrogen Society Promotion Act (Act No.37 of 2024), indicating that the government intends to promote domestic production of low-carbon hydrogen and its derivatives, which utilise CCS as a method of decarbonisation. The government will provide a CfD-style subsidy to selected suppliers of low-carbon hydrogen and its derivatives, and "blue" products are eligible so long as they meet the carbon intensity requirements (find out more in our briefing, [Low Carbon H₂ supply chain subsidy in Japan](#)).

Given that Japan ranks among the top five countries globally in terms of carbon emissions, has limited space for further renewables and continues to have significant industries in "hard to abate" sectors such as steel-making and chemicals, CCS is likely to play an important role in achieving carbon neutrality by 2050, and it is expected that Japan will be a big exporter of CO₂. The government is now negotiating bilateral agreements with potential importing countries relating to the export of CO₂ for sequestration in sub-seabed geological formations, which is required under the 2009 amendment to the London Protocol. Successful signing of such agreements with importing countries is expected to spur interest in further cross-border CCS projects involving Japan (in addition to the nine projects already selected by JOGMEC).

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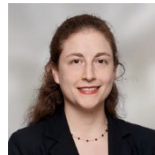
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