

JOGMEC's Approach to CCS Projects

Keisuke MIYOSHI, Director General, Hydrogen and CCS Project Department
Japan Organization for Metals and Energy Security (JOGMEC)

#AOGENERGY2024

Who is JOGMEC?

Japan Organization for Metals and Energy Security

Mission As agency of Japanese government (METI)

Secure the **stable supply** of Natural Resources for Japan



Oil & Natural Gas



Metals



Coal



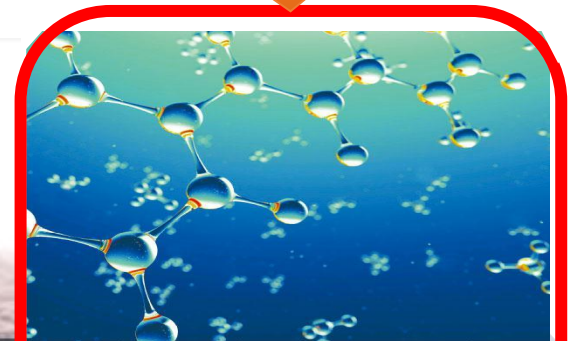
Geothermal



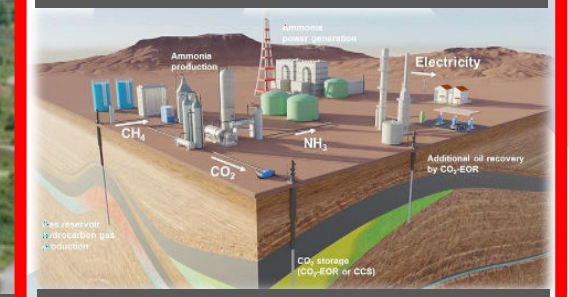
Stockpiling



Mine Pollution Control



Hydrogen/Ammonia



CCS

New Area

- Financial support: Support risk money with taking **equity capital and liability guarantee**.
- Technical support: Joint FS and technical study for challenging issue at the operation field/site.

Japan's CCS Long-Term Roadmap

- A business environment for commencement shall be prepared by 2030, involving cost reduction, public understanding, overseas CCS promotion, and CCS Business Act legislation. This is based on the rough estimation of enabling CO2 storage of **about 120 to 240 million tons as of 2050**, and a full-scale CCS business shall deploy after 2030.



Mton CO2

- Technical support.
- Storage site surveys
- Demonstration projects.**
- Guidelines preparation related to CCS

- Financial support

240 MMTPA
(IEA's Net Zero Emission Scenario)

120 MMTPA
(IEA's Announced Pledges Scenario)
Estimated annual storage volume target
(Based on IEA-estimated CCS volume scenario)



Year

(Source) METI: May, 2023



[Basic principles]

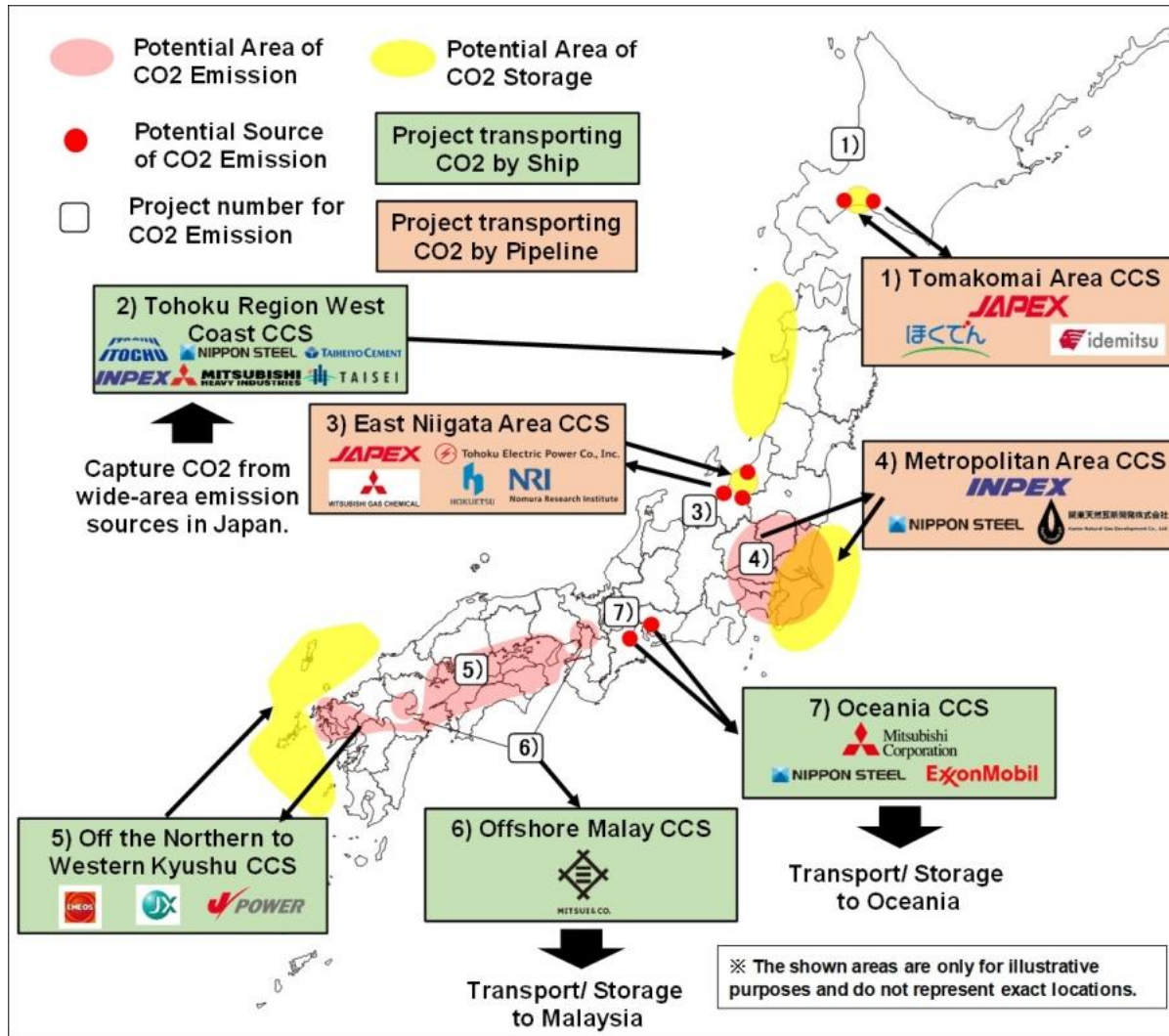
To implement CCS systematically and rationally to promote the sound development of CCS business in Japan with minimal social costs, thereby contributing to the development of Japan's economy and industry, securing a stable energy supply, and the achievement of carbon neutrality.



[Specific actions]

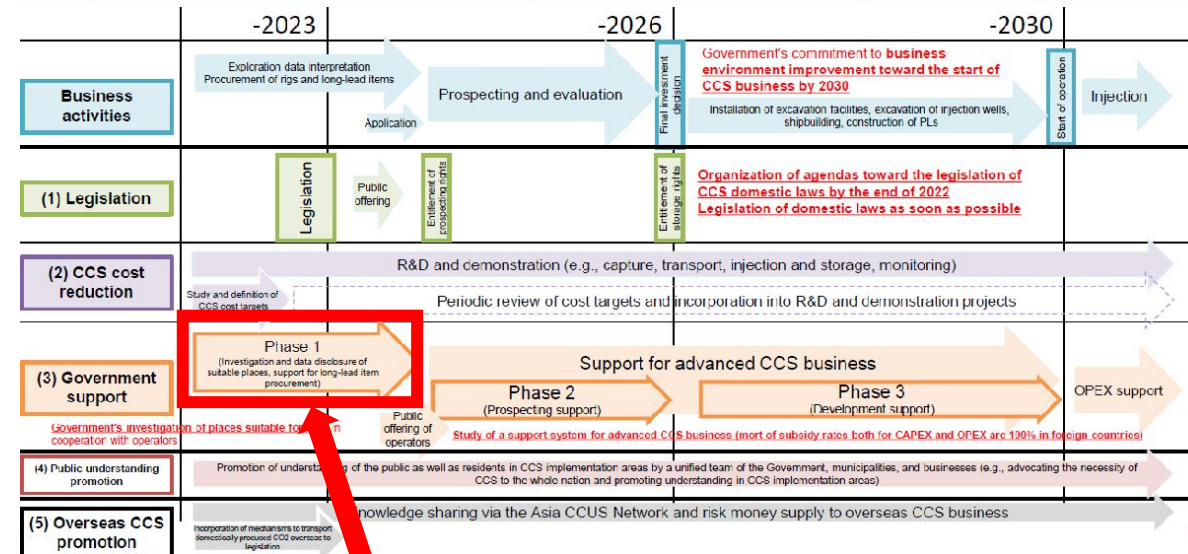
- (1) Government support for CCS business
- (2) Efforts for reducing CCS costs
- (3) Promotion of public understanding of CCS business
- (4) Promotion of overseas CCS business
- (5) Examination for the development of the CCS Business Act
- (6) Formulation and review of the CCS Action Plan

Advanced CCS Projects in Japan



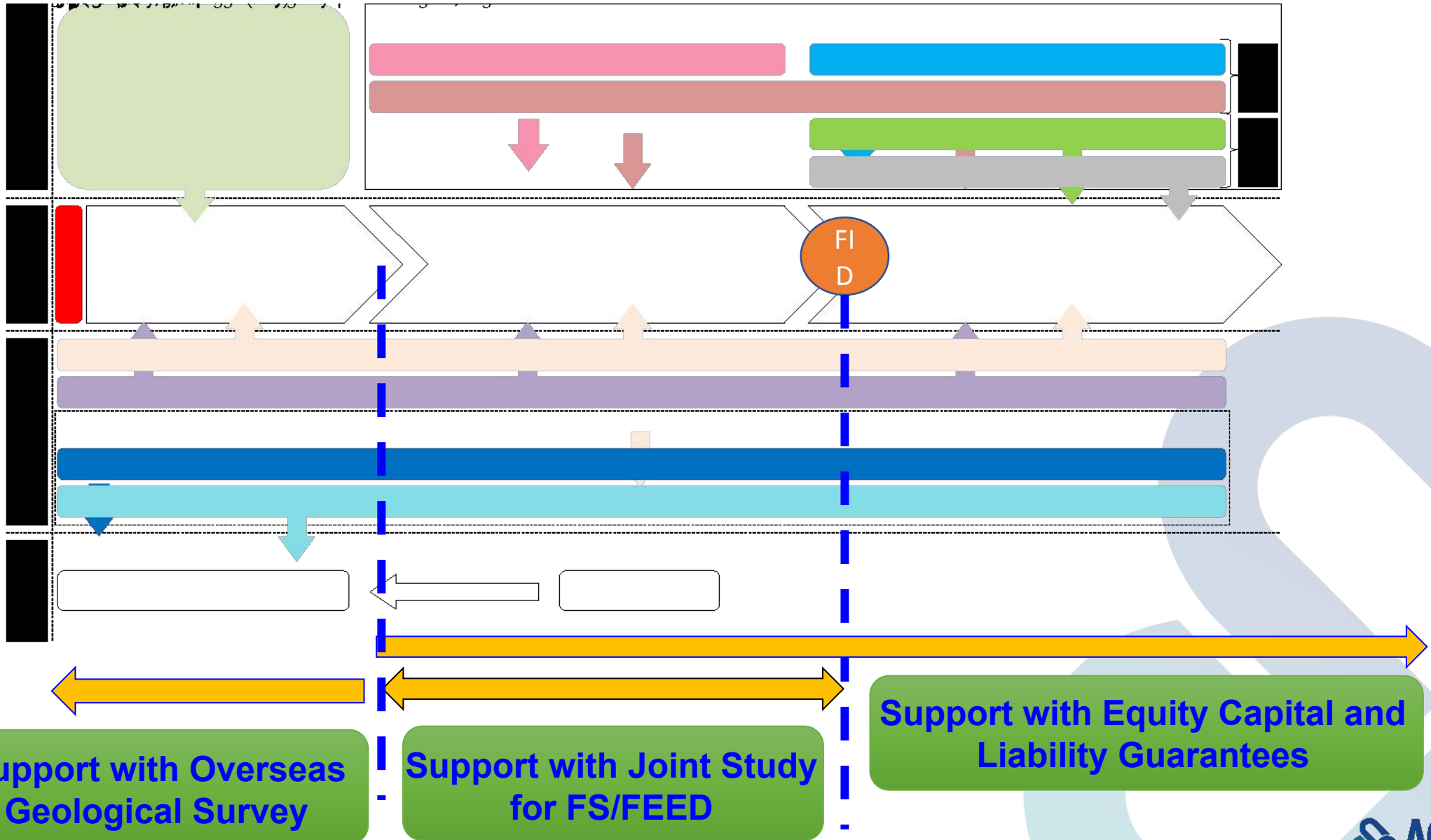
CCS Long-Term Roadmap Intermediate Summary

- Business environment improvement toward the start of CCS business by 2030 should be clearly declared as a government target.
- To achieve the target, the following actions should be taken:
 - Agendas toward the legislation of CCS domestic laws should be organized by the end of 2022 to legislate such laws as soon as possible.
 - Future cost targets should be defined for each CCS value chain, and R&D and demonstration should be conducted to reduce costs.
 - The Government should actively research places suitable for CCS in cooperation with operators (including disclosure of existing data). Ideal support from the Government for advanced CCS business should be studied, referencing to support systems including substantial subsidy systems (most of subsidy rates both for CAPEX and OPEX are 100%) in leading CCS countries such as Europe and the US. Ideal additional support from the Government should also be studied flexibly based on commercialization stages, referencing to subsidy systems in the US and other countries.
 - The Government, municipalities, and businesses should cooperate to promote understanding of the public as well as residents in CCS implementation areas.
 - Overseas CCS should be promoted through knowledge sharing via the Asia CCUS Network and risk money supply to overseas CCS business.

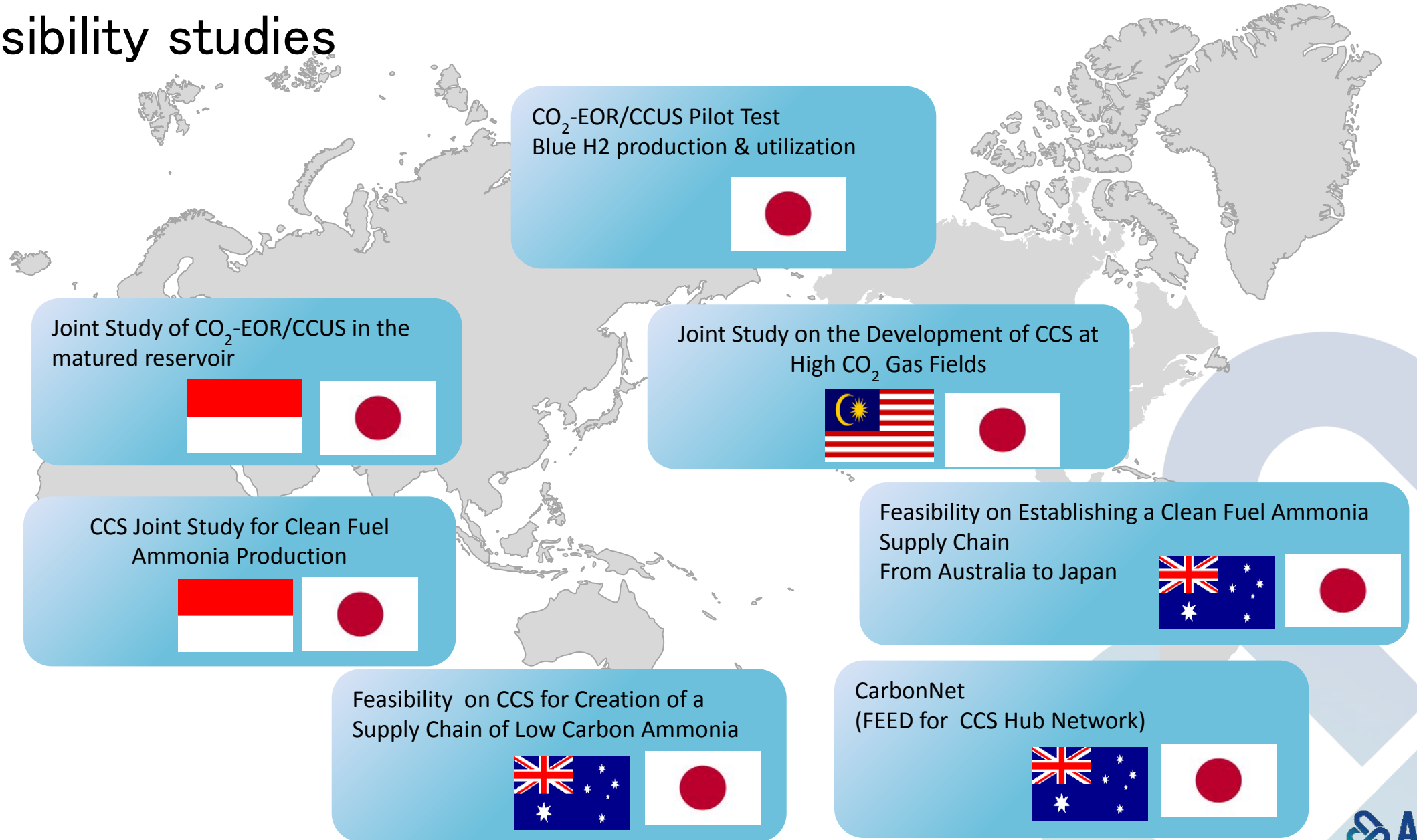


Scope of this study

Business Tools for CCS



Feasibility studies



Our ongoing CCS projects in Australia

Bonaparte CCS Project (with INPEX)

- Storage of CO2 emission from Ichthys LNG project
- Gas storage assessment permit (G-7-AP) awarded INPEX Browse, TotalEnergies, and Woodside (JV) in August 2022.
- JOGMEC/INPEX is supporting JV's evaluation of the permit.
- Opportunity for the Darwin-based, CCUS Hub proposed by the NT Govt.

Source: <https://www.inpex.co.jp/english/news/assets/pdf/20220824.pdf>

Low Carbon Ammonia Development (with MEPAU)

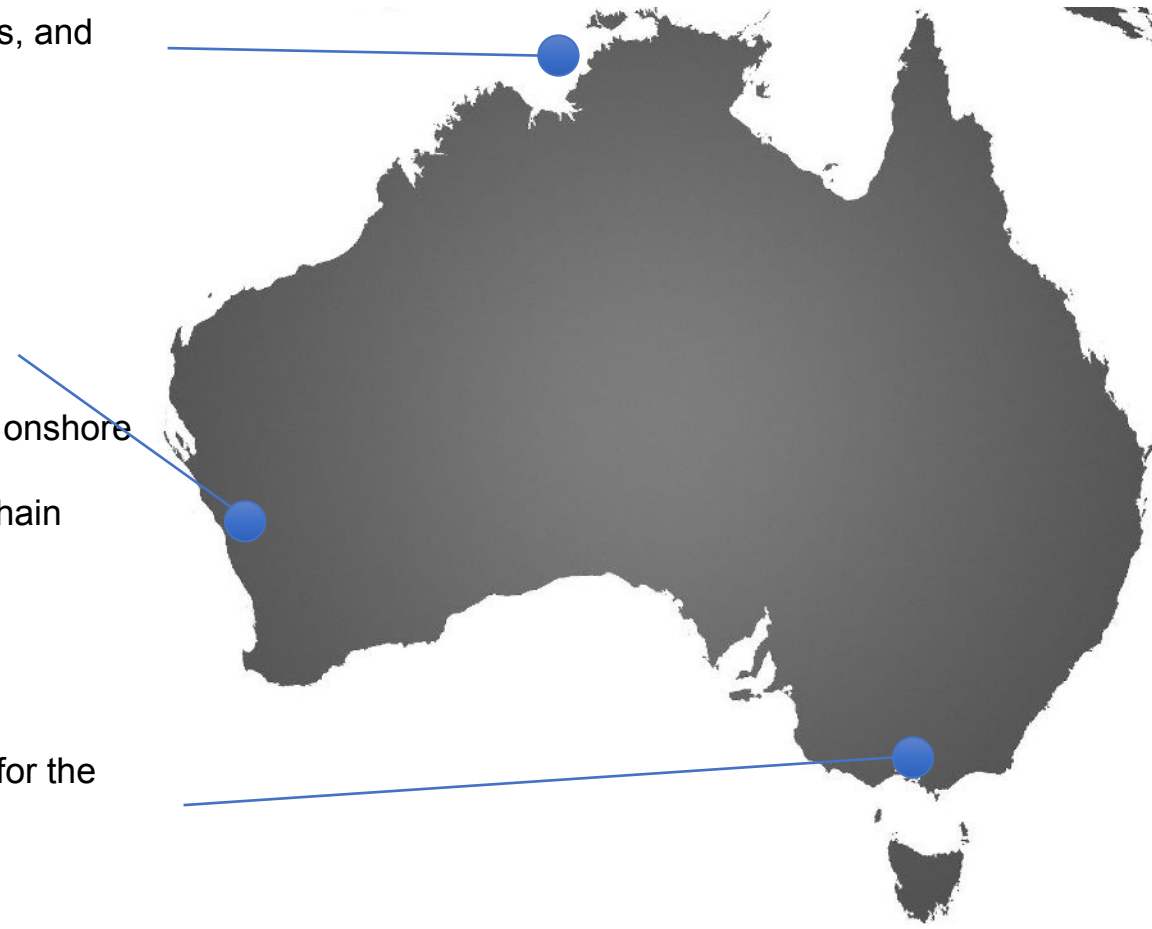
- Low carbon ammonia production led by MEPAU
- Associated CO2 to be stored in depleted gas reservoirs and/or saline aquifers in onshore Perth Basin
- MEPAU and JOGMEC has been executing the FS of the clean ammonia value chain

Source: https://www.jogmec.go.jp/english/news/release/news_15_000001_00026.html

CarbonNet (with VIC Govt.)

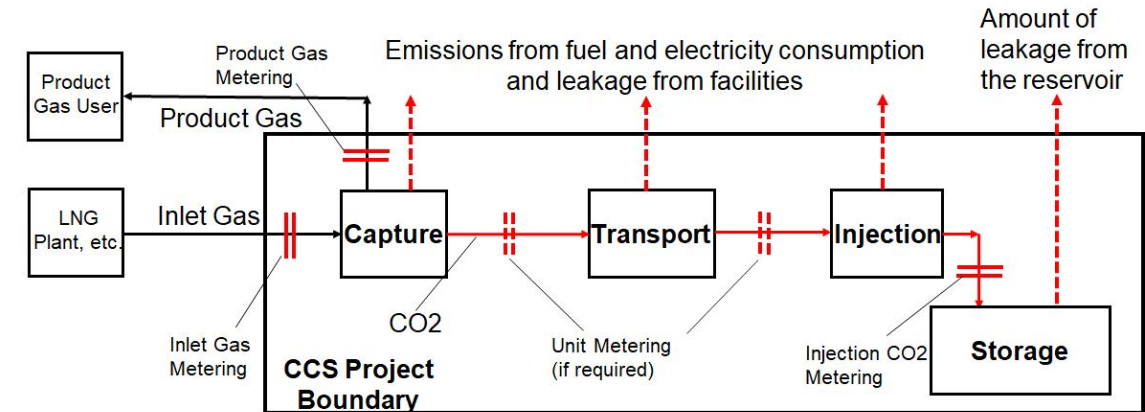
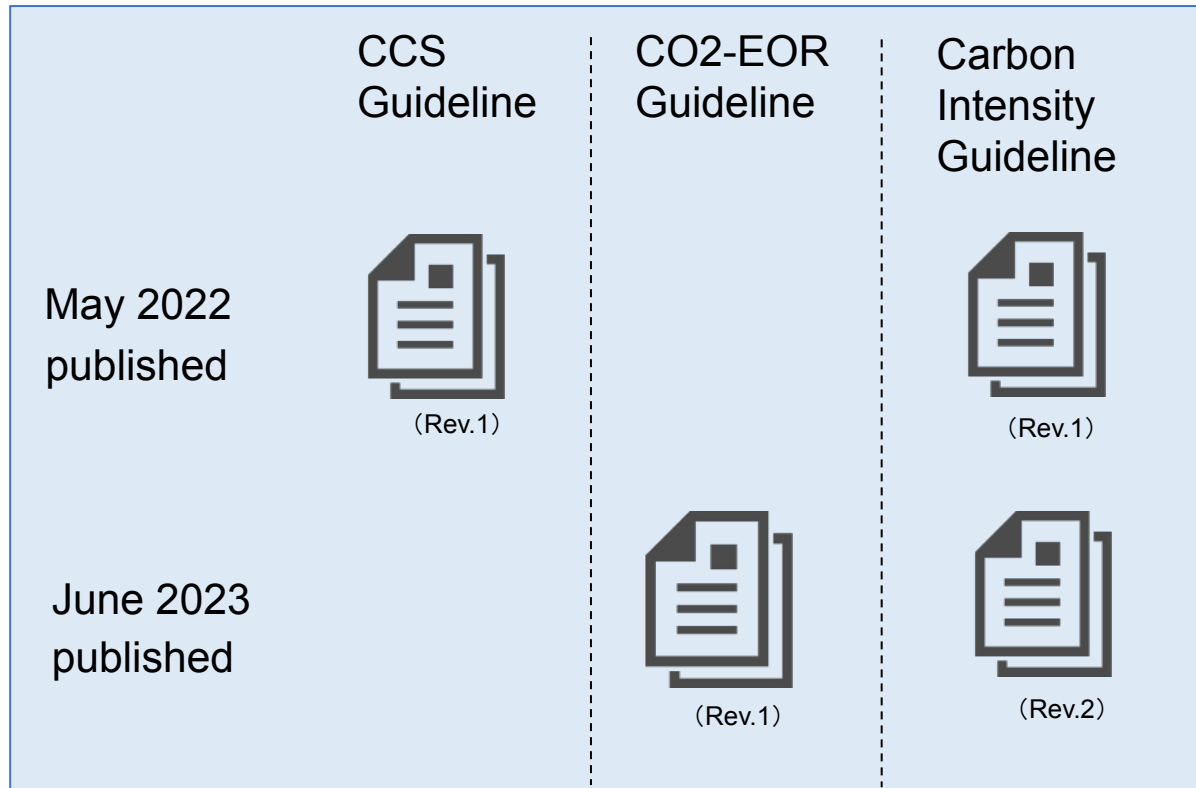
- CarbonNet project stands with the value chain of CCS & Lignite hydrogen
- JOGMEC signed an agreement for its engagement with the CarbonNet planned for the State of Victoria Government on January 20, 2022
- Supporting the FEED project being conducted by the Victorian Government

Source: https://www.jogmec.go.jp/english/news/release/news_01_00002.html

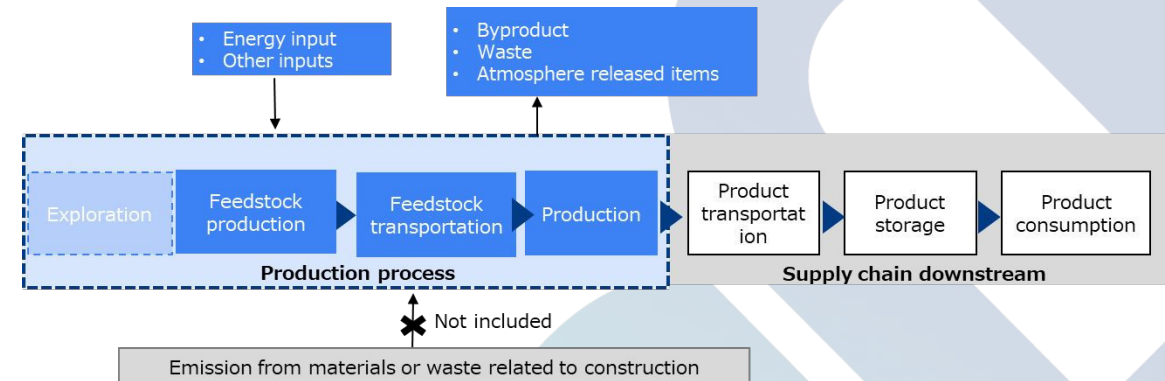


Recommended guideline for CCS, CO2-EOR and Carbon Intensity accounting framework

JOGMEC' Guideline



$$\begin{aligned}
 & \text{CO}_2/\text{GHG emission reduction amount} \\
 &= (\text{Captured CO}_2) - (\text{Emission from fuel/electricity consumption}) \\
 & - (\text{Fugitive emission})
 \end{aligned}$$



International Workshop on CO2 Cross-border Transportation

JOGMEC, METI, Petronas to work on cross-border CO2 transport (Oct 2023)



Workshop on CO2 cross-border transport and storage (CCS) in Asia and the Pacific (Feb 2024)



Thank you for your attention.

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