



Ministry of Economy, Trade and Industry

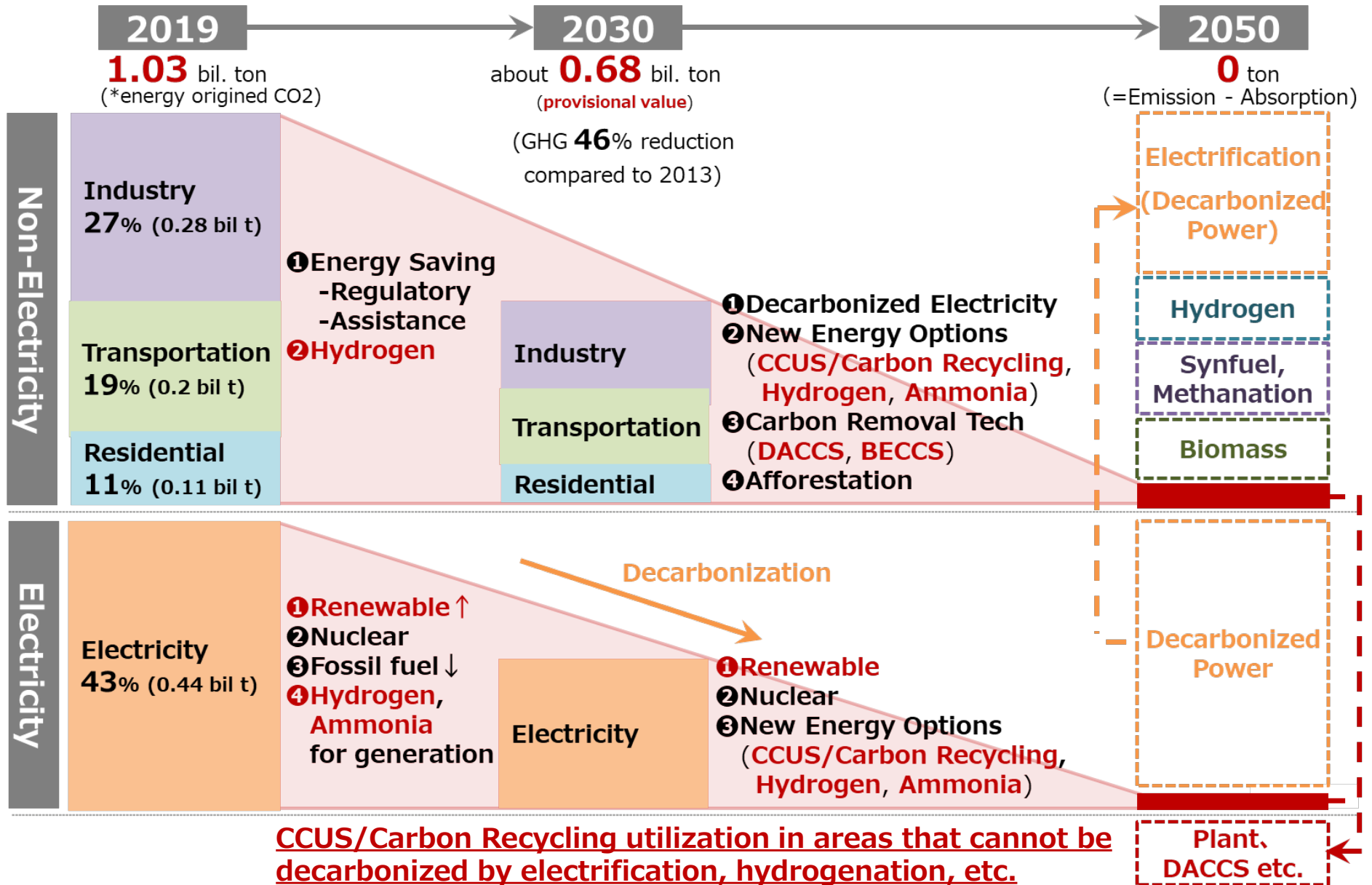
Japan's CCS Policy

Dec. 2024

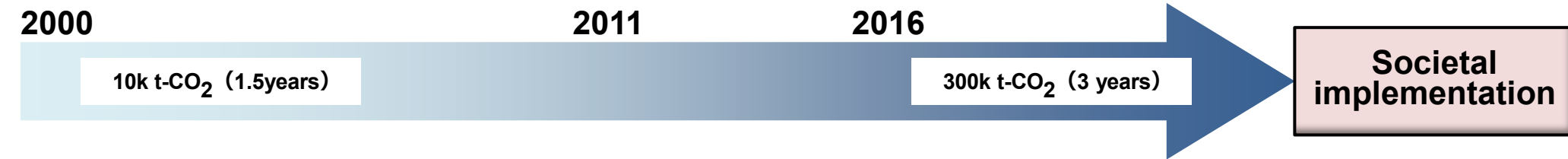
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Japan's pathway toward Carbon Neutrality by 2050



History of Japanese CCS Projects



Fundamental Research (Nagaoka CCS PJ)

- Subsurface monitoring
- Numerical simulation

Practical research & developments (Tomakomai Demonstration PJ)

- Safety management tech. for large-scale CCS
- Effective injection into large-scale reservoirs
- Promotion of Public Acceptance

Fundamental Tech. Developments (Post –monitoring of Nagaoka CCS PJ)

- Core sample tests
- Migration modeling (faults, wells)
- Numerical simulations
- Eval. of the env. impact on offshore areas
- Fiber-optic monitoring
- Geological modeling technology



Japan's "CCS Long-Term Roadmap"

[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.

[Objectives]

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



[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

Purpose

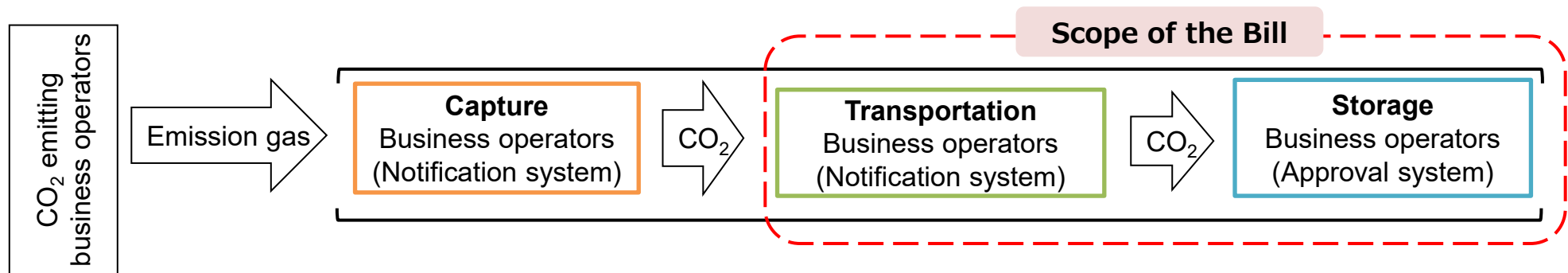
- ◆ Ensuring adequate business environment and public safety for CCS business in Japan

Scope

- ◆ Regulations for business operators of **pipeline transportation** and **storage**

*Including **not only safety regulation** but **also economic regulation**

*Regulations for Carbon capture will be considered in the future



London Protocol

- ◆ Japan is the contracting parties to the London Protocol 1996.
- ◆ Together with CCS business bill, **acceptance of the amendment of London Protocol was approved** by the National Diet on this May which **enable Japan to export CO₂**.

Purpose of “Advanced CCS Program”

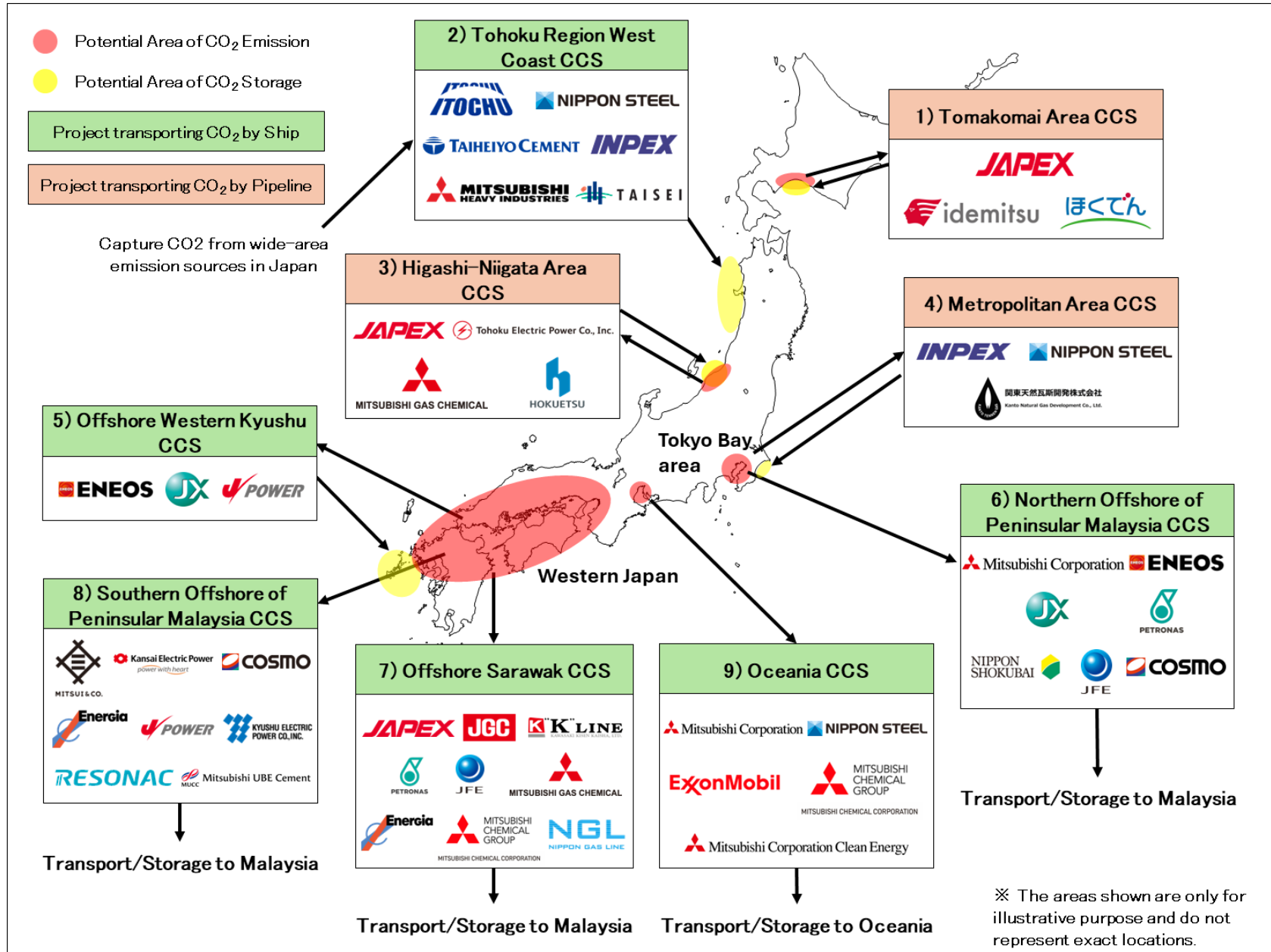
- To secure annual storage of 120-240 million tons of CO2 by 2050, A business model for CCS that can cross-sectoral should be established at an early stage. Thus, Japanese government selected “Advanced CCS projects” led by operators and will actively support them.
- This supporting program will establish various CCS business models by supporting projects with different combinations of CO2 source, transportation methods and CO2 storage areas. Furthermore, it aims to secure 6-12 million tons of CO2 storage per year by 2030.
- This year, this program will provide support for the analysis of this geologic data and feasibility study.

Possible types of CO2 source, transport methods, and CO2 storage areas

CO2 sources	Transport methods	CO2 storage areas
Thermal power plant	Pipeline	Onshore
Steel plant		
Chemical plant	Ship	Near shore
Cement plant		
Paper plant		
Hydrogen plant etc.		Offshore

Advanced Efforts for Commercialization of CCS

- JOGMEC selects Nine projects as Japanese Advanced CCS Projects -



Liquefied CO2 Shipping Demonstration Project

A demonstration project for long-haul transportation from emission sources to places suitable for storage will be carried out to establish liquefied CO2 shipping techniques. Through this project, LCO2 carrier will be expanded to LNG carrier (around 60K ton class).



Photo by New Energy and Industrial Technology Development Organization (NEDO) / Sanyu Kisen

Liquefied CO2 Shipping Demonstration Project

In the hub and cluster plan for CCS, liquefied CO2 ship transportation is an important technology for transporting CO2 which is captured at distant emission sources.

Route examples

Osaki CoolGen (IGCC)




- Capture
- Carbon Recycling R&D base

Maizuru Power Station (Coal fired power plant)

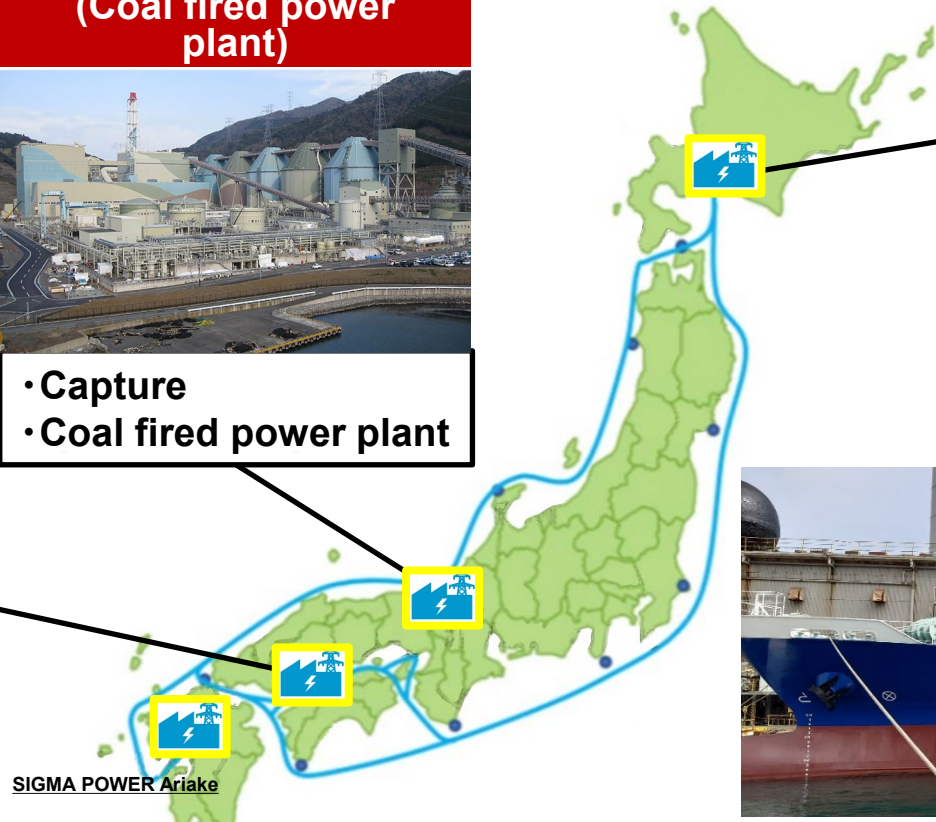


- Capture
- Coal fired power plant

Tomakomai CCS demonstration



- Storage and monitoring
- Tomakomai CCS/CR hub



Demonstration transportation of CO2 will start in 2024

Superiority of CCS Value Chain of Japan

Japan has competitive CO2 capture, transport, storage, and total engineering technologies for the CCS value chain. In addition, it is possible to construct an integrated CCS system from capture to storage. (already demonstrated in the Tomakomai Demonstration Project.)

Room for Growth

Capture

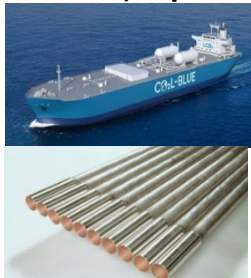


- Regarding solid absorbents and separation membranes, Japan's technology has **advantages in terms of energy consumption and selectivity and durability of separation membranes.**
- **MHI supplies 70% of the world market share** for separation and recovery plants using the amine absorption method.



Transport

(Maritime, Pipeline)



- **The low-temperature, low-pressure LCO2 carrier tanks,** currently being by NEDO, will be **the world's first technology** of its field once it implemented, and will enable **it as large as LNG carriers**(approx. several ten thousands of tons), thereby **attract demands from home and abroad.**
- Japanese companies have traditionally had an advantage in the manufacture of marine tanks for LCO2 carriers and marine equipment such as safety valves for tanks.



Storage/ Total Engineering



- Accumulation of technologies for monitoring technologies related to storage in Nagaoka, Tomakomai, and international joint research, which are shared by JCCS, technical research associations, and member companies.
- It is also **expected to be implemented to overseas reservoir development and attracts oil-producing countries.**



Future study to establish a support system for CCS

<Key Topics>

- Examination of support systems and financing schemes in leading overseas CCS cases
- CCS Cost reduction for business self-sustainability
- Coordination with the study and the discussion on GX-ETS and electricity decarbonization
- Coordination with the study on industrial site location for CN
- Earlier development of CO2 storage sites

<Schedule>

December	Discussion on Preliminary framework for the next support system
Beginning of 2025~	Detailed study and discussion based on the preliminary framework for the next support system
Summer of 2025	Interim summary of the next support system

<Committee Members List>

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