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# Policies for Carbon Capture and Storage(CCS) in Japan and overview of CCS under the Joint Crediting Mechanism(JCM)

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Kohei SENOO

Decarbonized Society Promotion Office,  
Global Environment Bureau, Ministry of the Environment, Japan

Maiko UGA

Office of Director for International Cooperation for Transition to  
Decarbonization and Sustainable Infrastructure, Global Environment  
Bureau, Ministry of the Environment, Japan



# Definition of CCS/verification tests in Japan



## CCS Definition

Carbon dioxide Capture and Storage (CCS) is the technology for capturing carbon dioxide (CO<sub>2</sub>) to inject it deep underground for long-term storage. It is expected to reduce substantial greenhouse gas emissions.

## Verification tests

Injection site	Period of injection	Purpose
Kubiki	March 1991 – June 1993	Enhanced oil recovery
Sarukawa	September 1997 – September 1999	Enhance oil recovery
Nagaoka	July 2003 – January 2005	Demonstration of geological storage of CO <sub>2</sub>
Yubari	November 2004 – October 2007	Enhanced coal bed methane recovery
Tomakomai	April 2016 – November 2019	Demonstration of geological storage of CO <sub>2</sub>

## 【Fundamental Principle】

The purpose of Long-term Road Map for CCS is that implementing CCS systematically and reasonably leads **the development of the Japanese economy and industry, the sustainable security for energy, and the contribution of carbon neutrality** while keeping the minimized social cost is minimized.

## 【Goal】

- ~2030 : Arranging an environment for the CCS business
- 2030~2050 : Magnifying the number of CCS projects
- 2050 : Captured **0.12~0.24billion-ton CO2 per year**

## 【Actions】

- 1) Government Support for CCS
- 2) Efforts to reduce the cost of CCS
- 3) Enhancement of the understanding for CCS
- 4) Promotion overseas CCS project
- 5) Discussion on building the legislation system
- 6) Review “Action Plan for CCS”

## Discussion Points

## Main Proposal for the discussion points

### 1. Storage

#### 【Sea Area】

- Review for a valid period of the License to carry out the sustainable operation for CCS
- Optimization of the monitoring system for CCS projects
- Correspondence against CO2 leakage after finishing the storage project

#### 【Land Area】

- A Necessity for the environmental assessment for CCS operated at the underground

- Consideration of the extension for a valid period of the CCS License
- Arranging to monitoring items and developing the technology of monitoring taken into account the regional character and the progress of the project
- The institutional design regarding finishing the CCS operation
  
- No needed an environmental assessment system to operate the CCS project in the land area at the moment.

### 2. Segregation, Recovering and Transferring

- Consideration of the legislation system at “Segregation/Recovering” and “Transferring” stage

- Supposing that a lot of new supply chains emerge, the acceptance system for CCS business operator should be introduced.

### 3. Exportation of CO2 for utilizing CCS

- Attentions in terms of environmental conservation exporting CO2 to CCS business partner

- Arranging the CO2 export license
- Building a new system to share the storage result to the business partner

# Model Project for CCUS Social Implementation toward Carbon Neutral and Recycling Society

Establishing CCUS technology with constructing a verification site and designing supply chain for the business

## 1. Purpose

Aiming to start CCUS business until 2030, this project attempts to establish commercial scale technology for CO<sub>2</sub> segregation, recovery, and beneficial utilization. At the same time, this project tries to design a supply chain for the business.

## 2. Concrete Project

### (1) Investigation project for finding suitable CCS land

This Project performs geological analysis and evaluates the storage potential for appropriate CO<sub>2</sub> storage under the ocean.

### (2) Model project for constructing CCUS supply chain

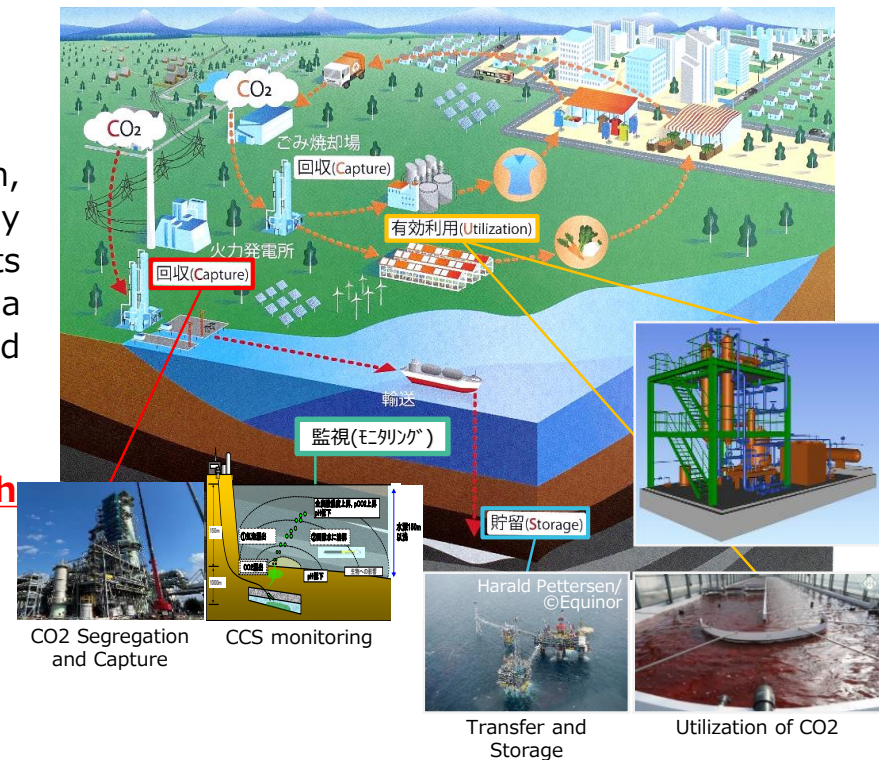
Based on the result of verification tests of CO<sub>2</sub> segregation, capture, and utilization facilities, this project designs the supply chain for the business. Furthermore, this project also constructs the model of carbon neutral and recycling society, considers a feasibility study for reasonable CO<sub>2</sub> transfer and storage, and accumulates knowledge about relevant technique.

### (3) Project for implementing appropriate CO<sub>2</sub> injection with protecting on the ocean climate

Using the result of verification test in Tomakomai, this project thinks how to use cutting edge technology, introduce appropriate monitoring and regulations take into account the influence for many stakeholders.

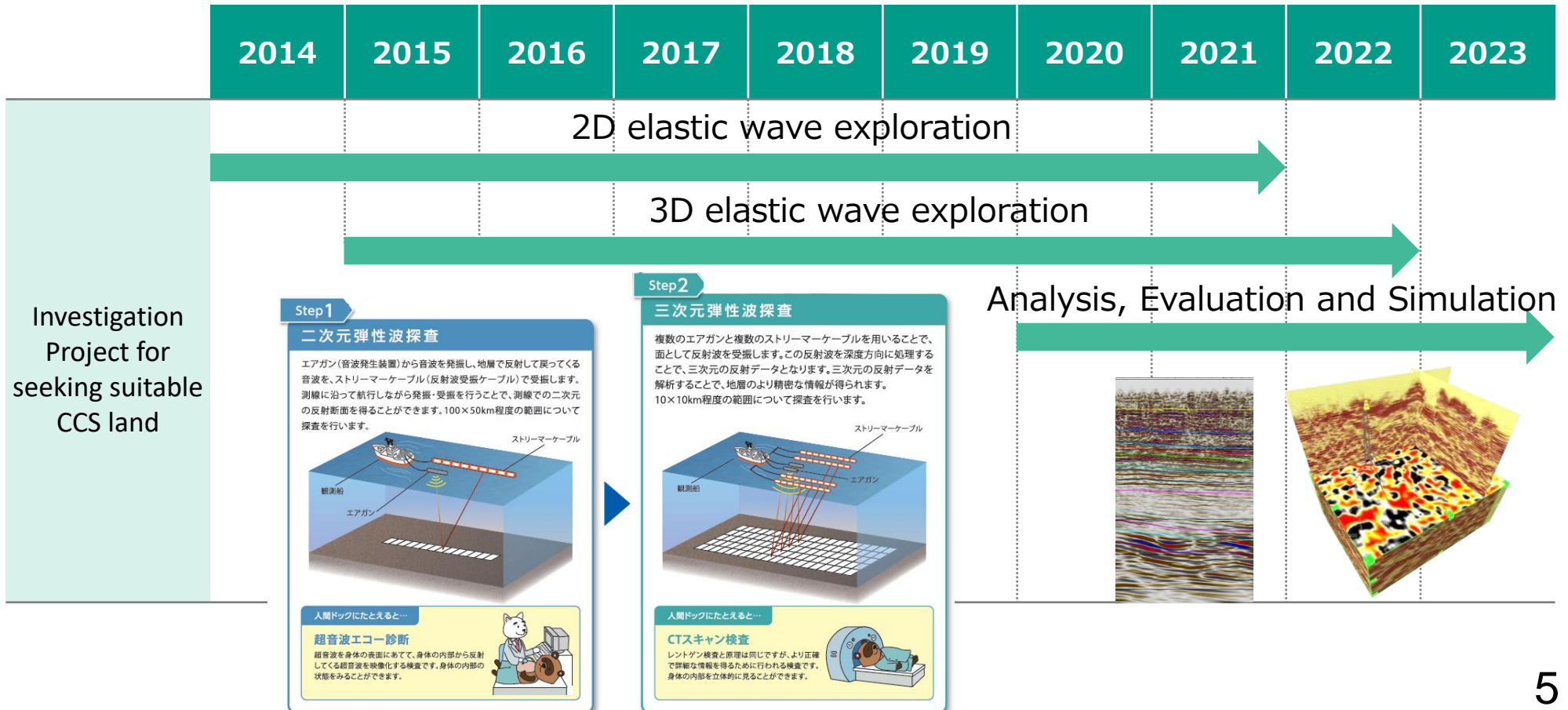
## 3. Image

### Image of CCUS Verification test



# (1) Investigation Project for seeking suitable CCS land

- Implementing 2D/3D elastic wave exploration around the Sea of Japan
- Implementing geological analysis, evaluation for the storage potential, and simulation CO<sub>2</sub>-movement based on the result of 2D/3D elastic wave exploration
- Transferring this result for sharing this data with the private companies



# (3) project for implementing appropriate CO2 injection with protecting on the ocean climate

This project tries to establish the suitable monitoring method for CCS on the ocean

## 1. Purpose

This project aims to establish a proper monitoring method using cutting-edge technologies for reducing the impact for the ocean environment and implementing appropriate CCS projects.

## 2. Concrete Project

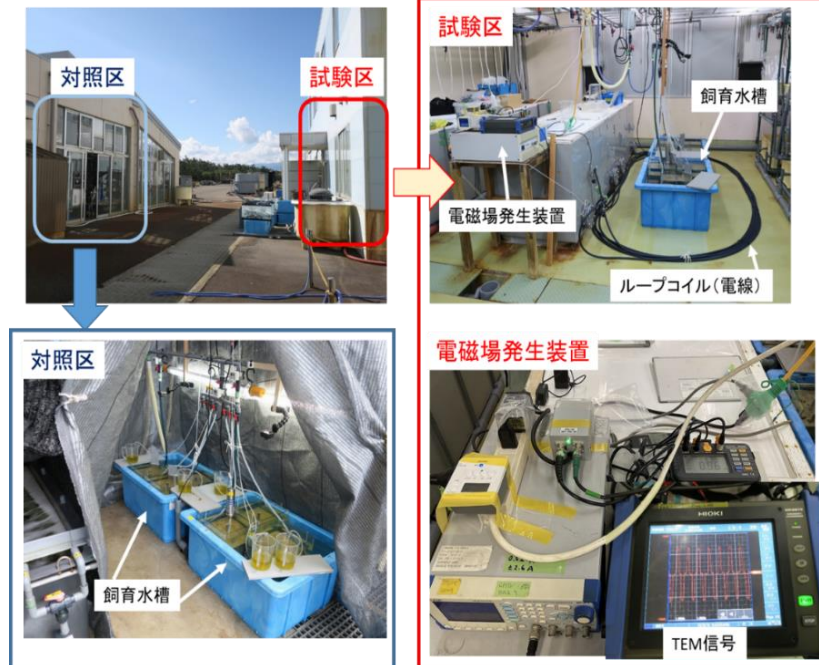
### ① Monitoring investigation for CCS under the ocean

This project establishes the appropriate and reasonable application of monitoring technology depending on the situation of CCS and the evaluation method for CO2 monitoring. In addition, this project releases this result properly for the citizens.

### ② Exploring reasonable monitoring methods for CCS on the ocean

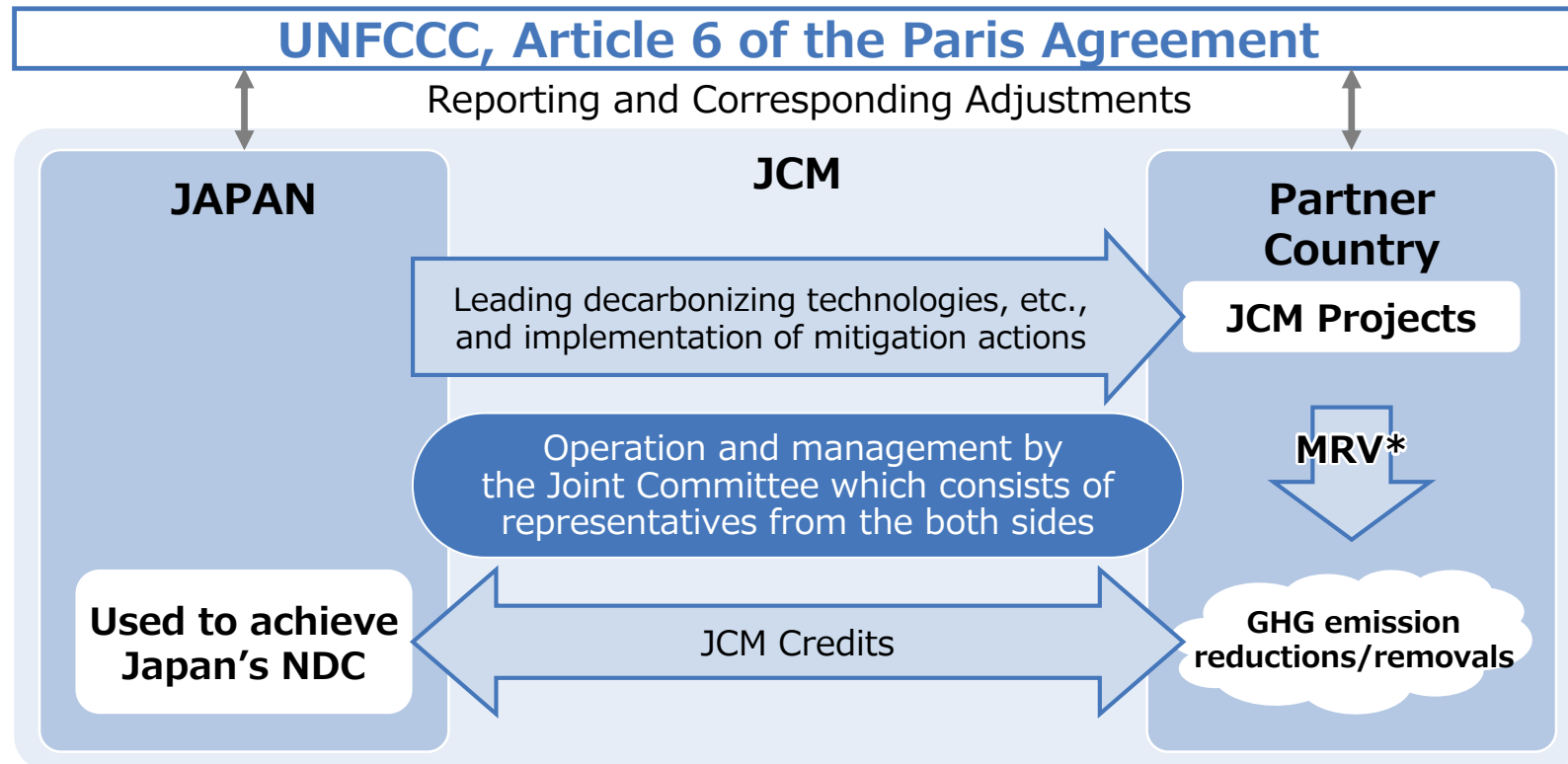
CO2 stored under the ocean is monitored by elastic wave exploration, but this method has negative impacts for ocean biodiversity. So, this project performs the laboratory experiment for seeking new monitoring technology which does not harm the ocean creatures and considers to the apply for the actual ocean in terms of environmental protection.

## 3. Image



# Basic Concept of the JCM

- Facilitate diffusion of leading decarbonizing technologies and infrastructure, etc., through investment by Japanese entities, thereby contributing to GHG emission reductions or removals and sustainable development in partner countries.
- Contribute to the achievement of both countries' NDCs while ensuring the avoidance of double counting through corresponding adjustments.
- Implement the JCM consistent with the guidance on cooperative approaches, referred to in Article 6, paragraph 2 of the Paris Agreement.





- The JCM Rules & Guidelines are developed with each JCM partner country.
- However, CCS is currently not included in the scope of the JCM and not covered in these documents.
- Necessary revision/addition of CCS rules are under consideration by the Ministry of the Environment and Ministry of Economy, Trade and Industry of Japan.

## Items to be considered

1. Participation conditions
2. Sectoral scope
3. Eligible projects
4. Reference emissions
5. Project stage within the scope
6. GHG sources
7. Monitoring
8. Credit reserve

## Monitoring

- In principle, the duration of closure period monitoring should be determined in accordance with the host country or region's regulations.
- In case there are no such regulations, the duration necessary to determine that there are no detectable long-term leakage of CO<sub>2</sub> should be established.

## Credit reserve

- Taking into consideration post-injection leakage risk, the credit reserve is one of the options.
- A portion of verified credits is subtracted from issued credits as a reserve.
- The corresponding reserve credits will be canceled when CO<sub>2</sub> leakage is detected, while project participants acquire the reminting credits in the reserve account if no leakage is detected.