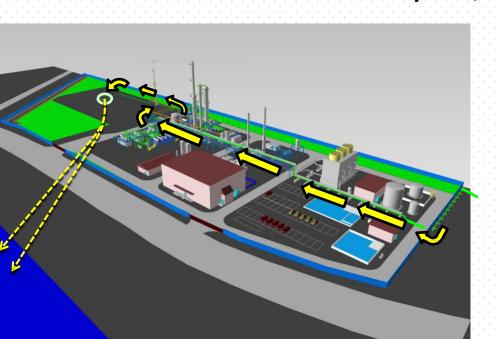
# 6th IEA International CCS Regulatory Network Meeting, 27-28 May 2014, IEA Paris



# CCS Regulation and Demonstration in Japan

May 27, 2014



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#### Ministries involved in CCS



- ☐ Ministry of the Environment (MOE)
- 2007: Amendment to "the Marine Pollution Prevention Act"
- to ratify the 1996 London Protocol
- to regulate offshore storage for CCS projects
- ☐ Ministry of Economy, Trade and Industry (METI)
- 2009: "For Safe Operation of a CCS Demonstration Project"
- 2012: Tomakomai CCS Demonstration Project to be operated in 2016



- 1. Tomakomai CCS Demonstration Project
- 2. Offshore CO<sub>2</sub> Storage Regulation
- 3. Environmental Impact Assessment for Tomakomai CCS Project
- 4. Monitoring Plans for Tomakomai CCS Project
- 5. Future Plan of Tomakomai CCS Project



# 1. Tomakomai CCS Demonstration Project

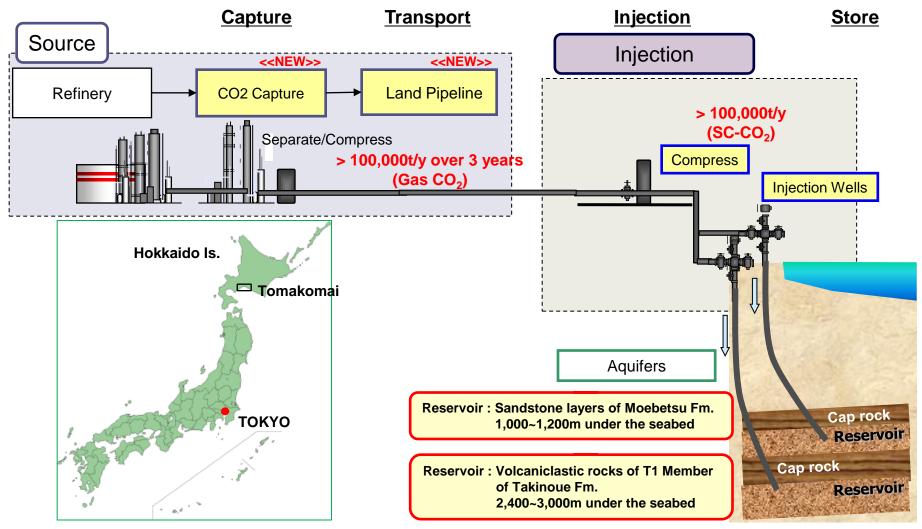
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# **Overview of CCS Demonstration Project**



2012: METI commissioned the Tomakomai CCS Project to JCCS

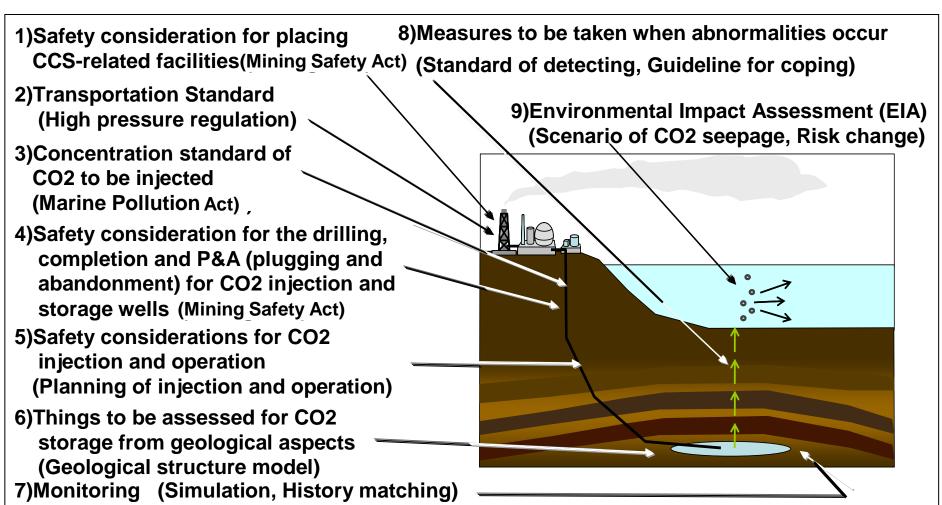
2016: The project to start 3-year operation



### **METI Guidance for CCS Demonstration**



"For safe operation of a CCS demonstration project" released by METI in 2009.



The document is downloadable at http://www.meti.go.jp/english/press/data/pdf/090807\_02PDF.pdf



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#### **Amended Marine Pollution Prevention Act**



#### Key Provisions for Offshore CO<sub>2</sub> Storage:

- (1) Anyone intending to dispose CO<sub>2</sub> stream under the seabed must obtain a permit from Minister of the Environment (Article 18.8)
- (2) The Minister of the Environment shall not issue a permit for CO<sub>2</sub> stream storage under the seabed unless ....., the way of storing CO<sub>2</sub> stream will not harm the conservation of the marine environment at the storage site ...... (Article 18.9)
- (3) Those who hold a permit for CO<sub>2</sub> stream storage under the seabed must monitor status of the pollution at the storage site and report monitoring results to Minister of the Environment. (Article 18.12)

# Offshore CO<sub>2</sub> Storage Regulation System



Marine Pollution Prevention Act

Cabinet Order on Marine **Pollution Prevention** 

Prohibition of sub-seabed storage of hazardous substances

Criteria for exception

- Areas licensed for mineral exploitation
- Purity standard (99% CO<sub>2</sub> using Amine)

Ordinance of MOE for the determination of methods for measuring concentration of CO<sub>2</sub> stream

Ordinance of MOE for dumping permit

Guideline of MOE for CO<sub>2</sub> sub-seabed dumping

Notification of MOE for offshore CCS permit

Valid period for permit: 5 years or less

(Renewal of permit to be required every 5 years) **Application for Permit** 

- Project Plan
- Monitoring Plan

Attachments to Application

- Site selection report
- Environmental Impact **Assessment Report**
- Explanation for no other options available
- Financial capability
- Technical capability
- Outline of the entire project (beyond permitting period) a



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# **Environmental Impact Assessment Report**



Major Items to be Covered in Environmental Impact Assessment (EIA) Reports (Article 4 in Ordinance)

- (1) Characteristics of CO<sub>2</sub> stream to be disposed
- (2) Location, area and amount of CO<sub>2</sub> leakage predicted based on leak scenarios
- (3) Items to be investigated as potentially affected by the assumed CO<sub>2</sub> leakage
- (4) Baseline data of the items to be investigated
- (5) Evaluation of impacts of the assumed CO<sub>2</sub> leakage on the items to be investigated

#### **Leak Scenarios and EIA**



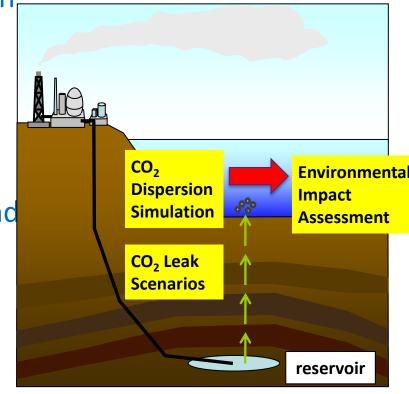
 Potential leakage assessment, based on multiple scenarios for CO<sub>2</sub> leak from reservoir to the surface of the seabed



 Multiple predictions of CO<sub>2</sub> dispersion in the sea, based on the most critical results from the CO<sub>2</sub> leak scenarios; and a severer setting



- Environmental impact Assessment, based on the following thresholds:
  - ✓ Threshold for impacts on marine creatures :  $\Delta pCO_2 > 200 \mu$  atm
  - ✓ Threshold for  $CO_2$  detecting:  $\Delta pCO_2 > 10 \mu$  atm





> 24-hour average values

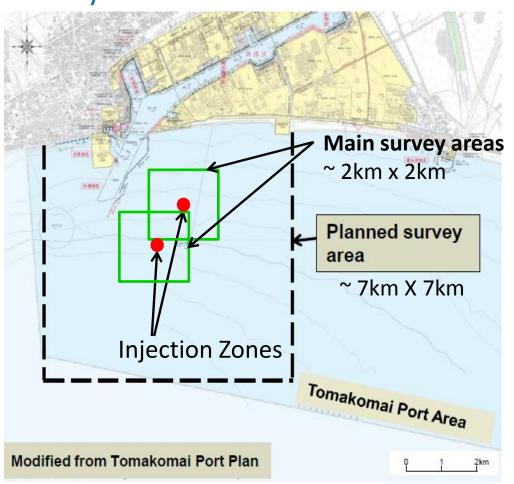


Within around 2km x 2km

# **Marine Environmental Survey**



#### Survey Areas:



#### Major Planned Surveys:

- Survey of seabed surface by Side-Scan Sonar and Subbottom Profiler
- Sampling of seawater by Water Sampler for concentration of CO<sub>2</sub> and plankton observation etc.
- Sediment survey by Bottom Sampler
- Benthos observation by Bottom Sampler, divers, ROV and Dredge

Pre-injection (for EIA): 4 seasonal surveys

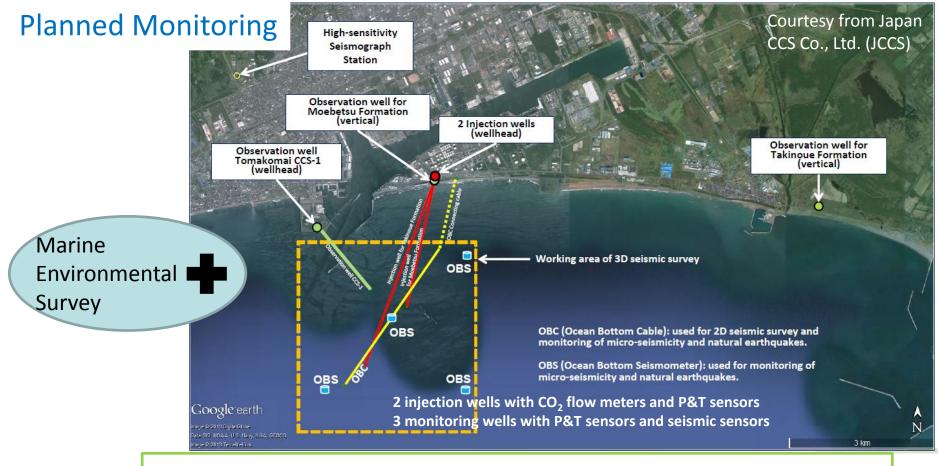
completed from Summer 2013 to Spring 2014



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# **Monitoring Plans**







#### Monitoring plans to be submitted on permit application:

(Article 1-3 in Ordinance)

- 1. Monitoring under normal situation
- 2. Monitoring for possible CO<sub>2</sub> leakage
- 3. Monitoring for adverse impact in case of CO<sub>2</sub> leakage



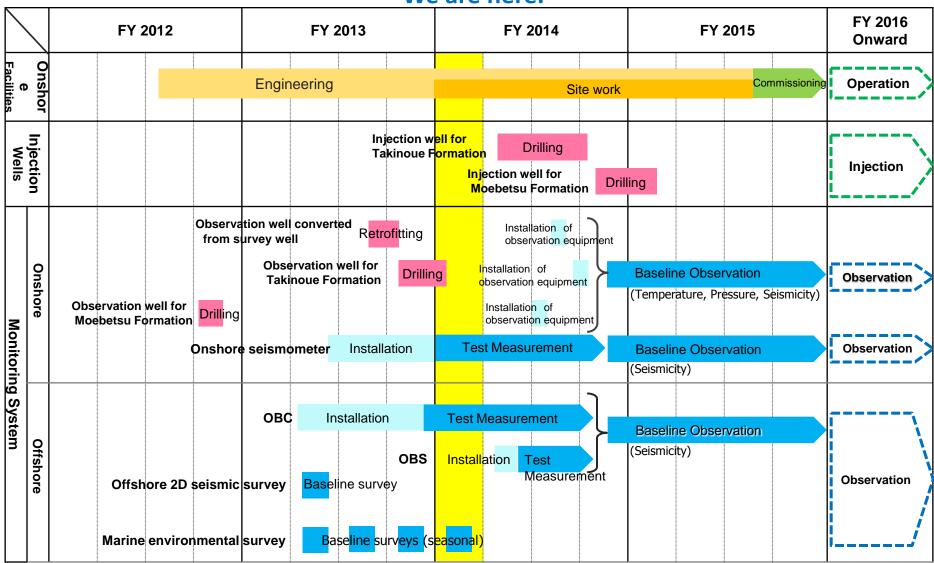
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# **Future Plan of CCS Demonstration Project**





As of Apr. 9, 2014



OBC ( Ocean Bottom Cable ): used for 2D seismic survey and monitoring of micro-seismicity and natural earthquakes.

OBS ( Ocean Bottom Seismometer ) : used for monitoring of micro-seismicity and natural earthquakes.





公益財団法人 地球環境産業技術研究機構 Research Institute of Innovative Technology for the Earth URL: http://www.rite.or.jp