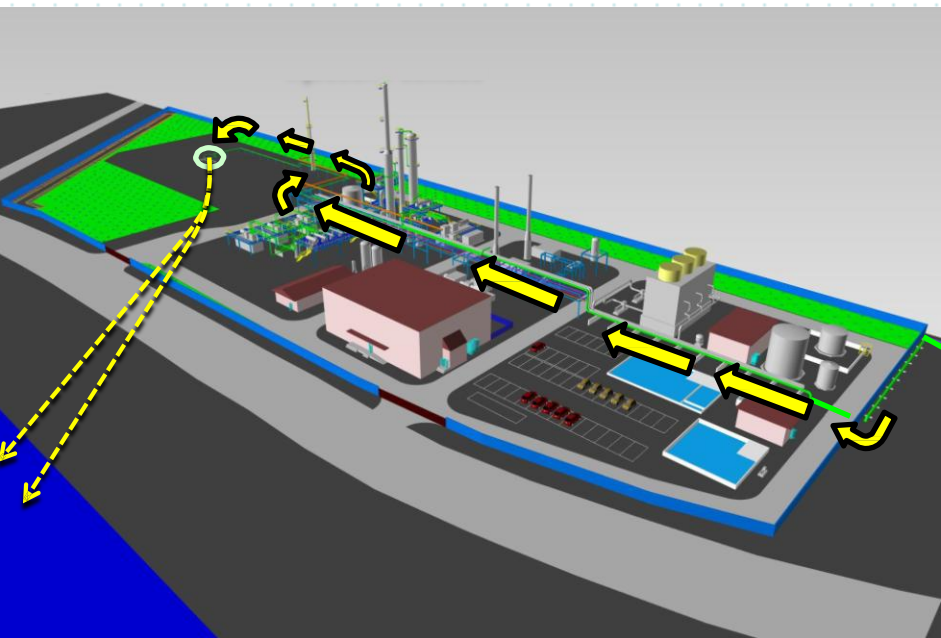


CCS Regulation and Demonstration in Japan

May 27, 2014



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Research Institute of Innovative
Technology for the Earth (RITE)

☐ 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 CO₂ Storage Regulation**
- 3. Environmental Impact Assessment for Tomakomai CCS Project**
- 4. Monitoring Plans for Tomakomai CCS Project**
- 5. Future Plan of Tomakomai CCS Project**

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2. Offshore CO₂ Storage Regulation

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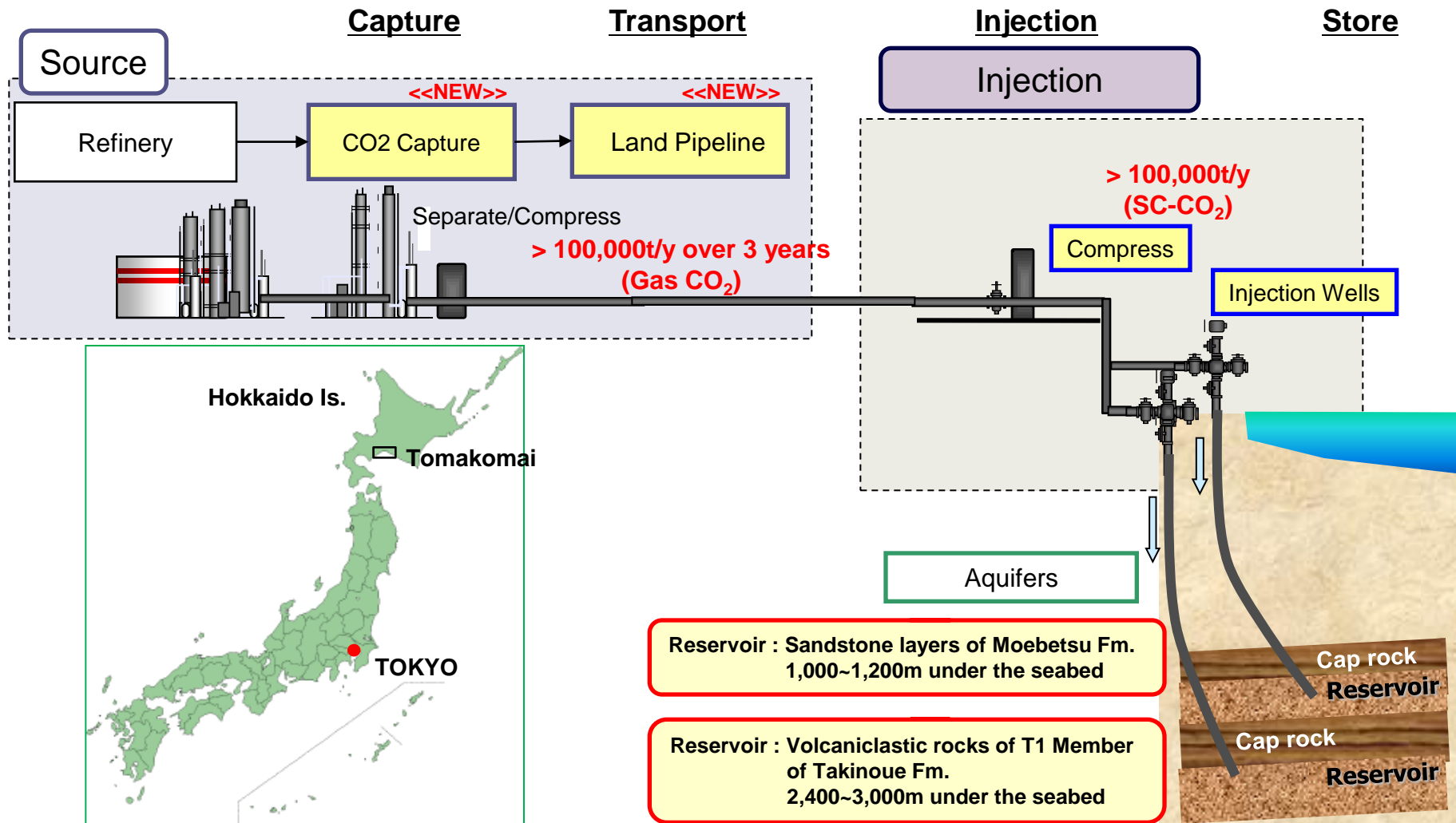
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Overview of CCS Demonstration Project

2012: METI commissioned the Tomakomai CCS Project to JCCS

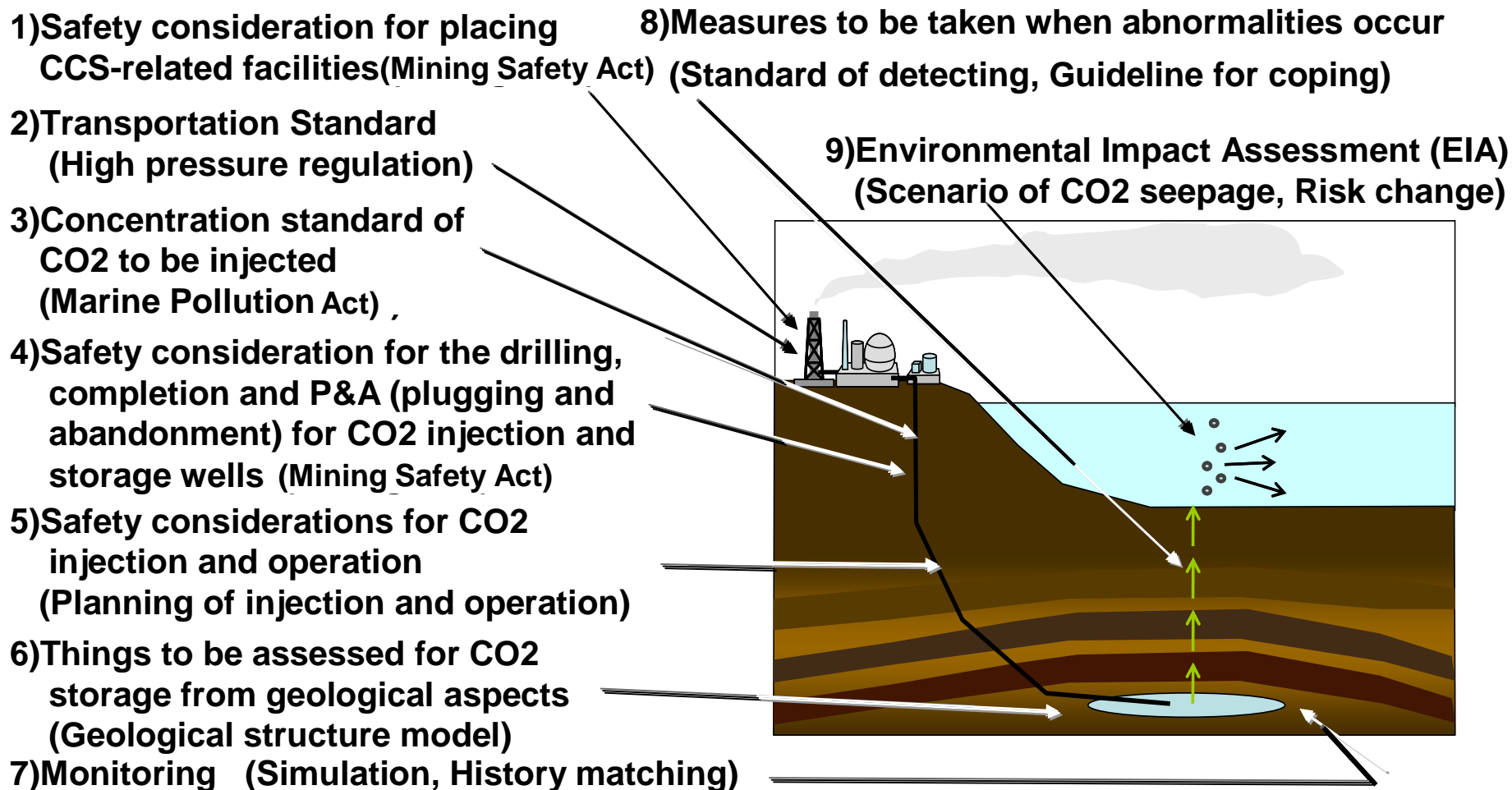
2016: The project to start 3-year operation



Courtesy from Japan CCS Co., Ltd. (JCCS)

METI Guidance for CCS Demonstration

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



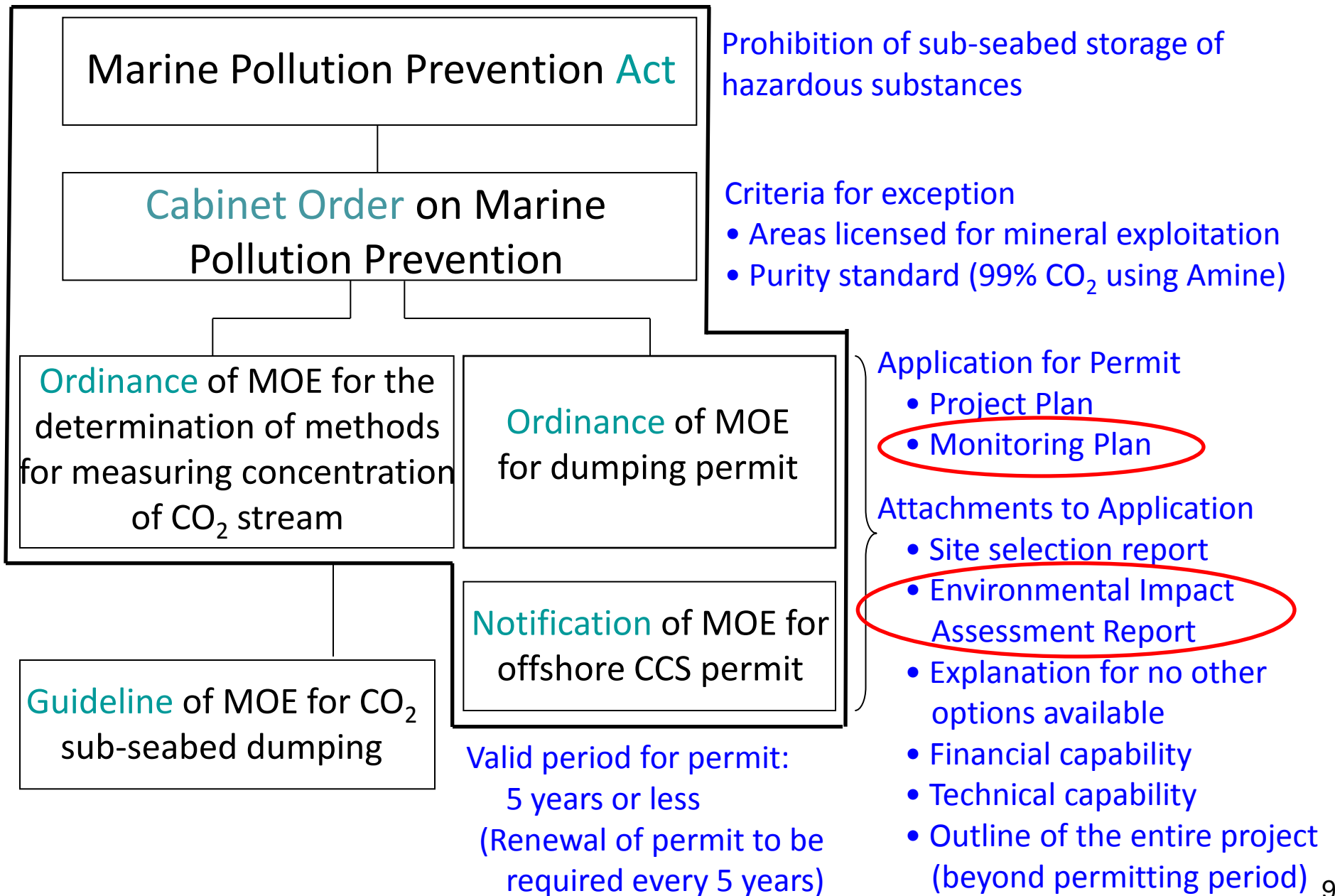
The document is downloadable at http://www.meti.go.jp/english/press/data/pdf/090807_02PDF.pdf

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Key Provisions for Offshore CO₂ Storage:

- (1) Anyone intending to dispose CO₂ 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 CO₂ stream storage under the seabed unless, **the way of storing CO₂ stream will not harm the conservation of the marine environment at the storage site** (Article 18.9)
- (3) Those who hold a permit for CO₂ 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 CO₂ Storage Regulation System



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

- (1) Characteristics of CO₂ stream to be disposed
- (2) Location, area and amount of CO₂ leakage predicted based on leak scenarios
- (3) Items to be investigated as potentially affected by the assumed CO₂ leakage
- (4) Baseline data of the items to be investigated
- (5) Evaluation of impacts of the assumed CO₂ leakage on the items to be investigated

- Potential leakage assessment, based on multiple scenarios for CO₂ leak from reservoir to the surface of the seabed



- Multiple predictions of CO₂ dispersion in the sea, based on the most critical results from the CO₂ leak scenarios; and a severer setting



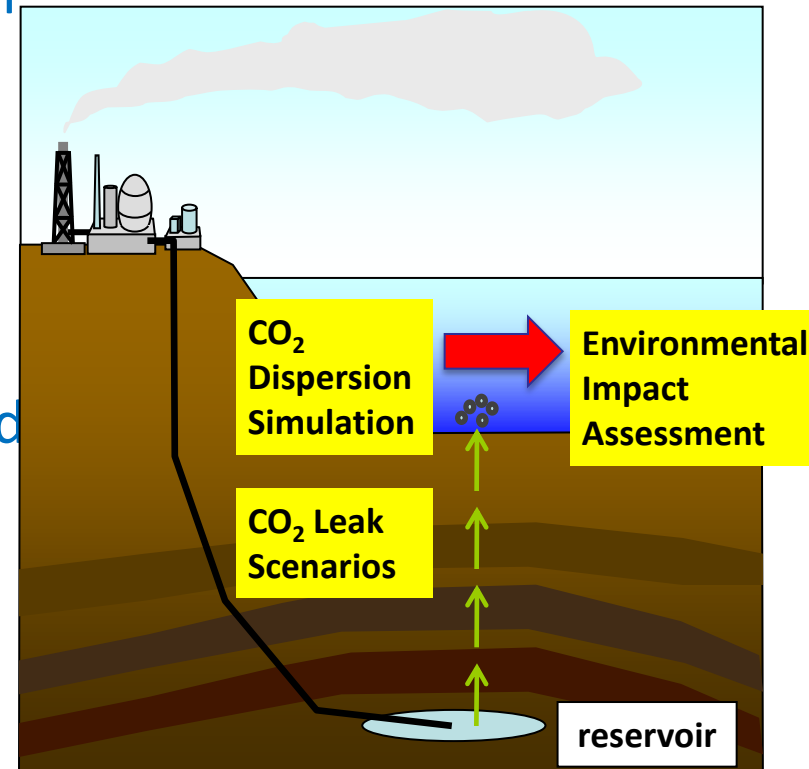
- Environmental impact Assessment, based on the following thresholds:

✓ Threshold for impacts on marine creatures :
 $\Delta p\text{CO}_2 > 200 \mu \text{ atm}$

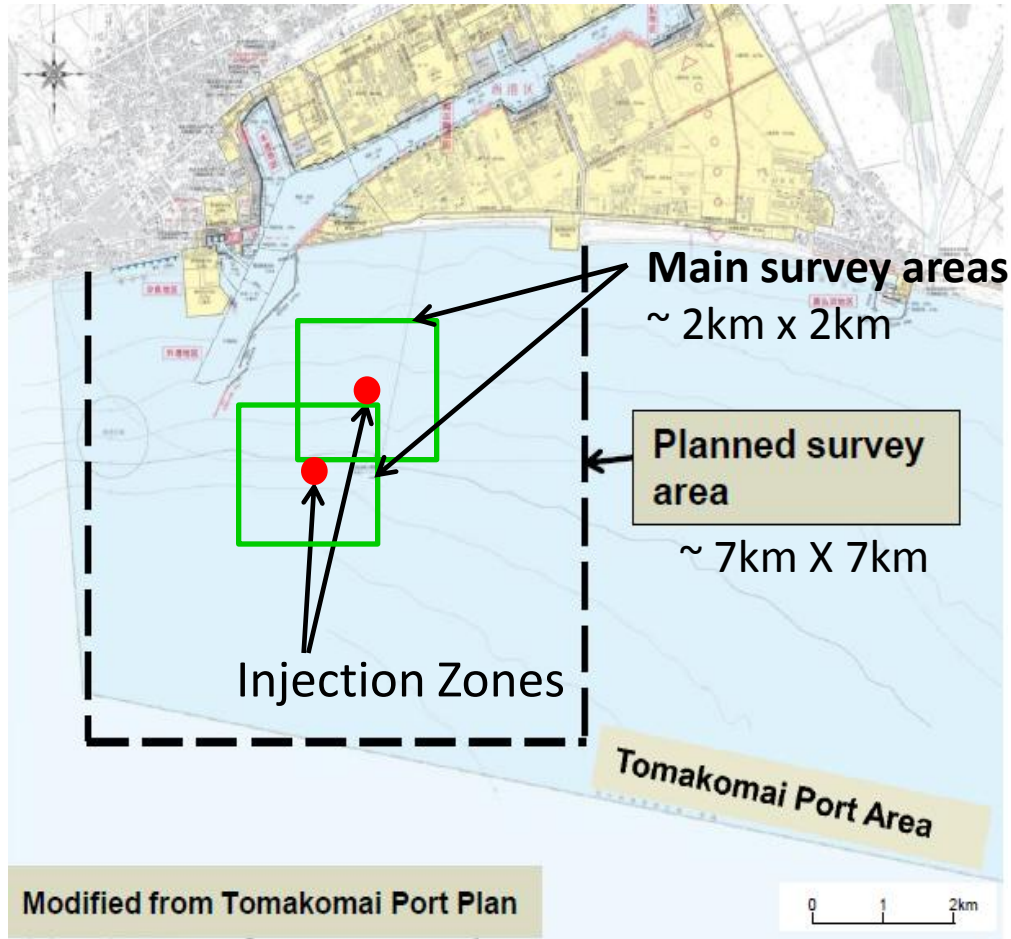
➡ > 24-hour average values

✓ Threshold for CO₂ detecting:
 $\Delta p\text{CO}_2 > 10 \mu \text{ atm}$

➡ Within around 2km x 2km



Survey Areas:



Major Planned Surveys:

- Survey of **seabed surface** by Side-Scan Sonar and Sub-bottom Profiler
- Sampling of **seawater** by Water Sampler for concentration of CO₂ and plankton observation etc.
- **Sediment** survey by Bottom Sampler
- **Benthos observation** by Bottom Sampler, divers, ROV and Dredge

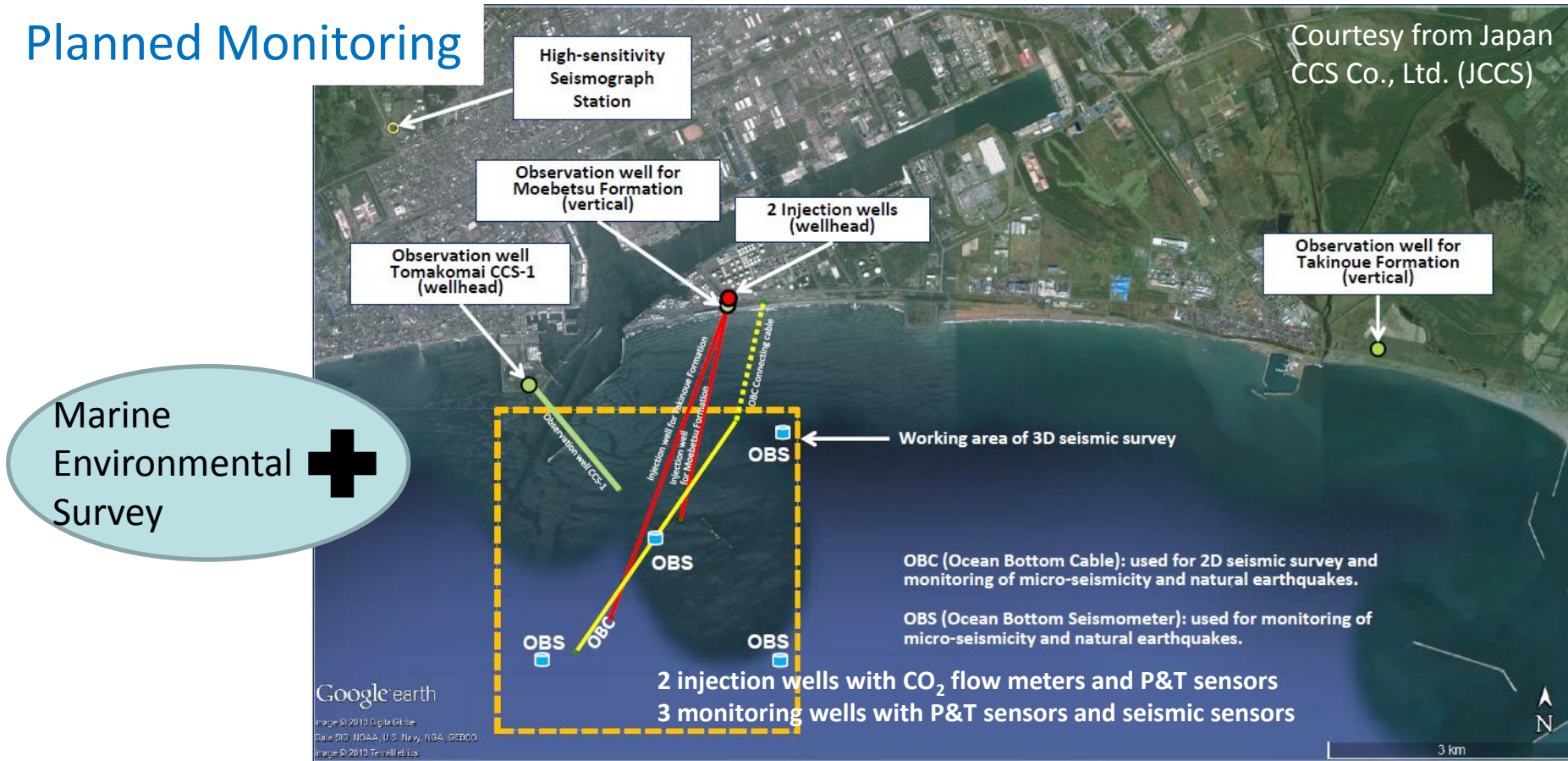
Pre-injection (for EIA) : 4 seasonal surveys

– completed from Summer 2013 to Spring 2014

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Monitoring Plans

Planned Monitoring



Monitoring plans to be submitted on permit application:
(Article 1-3 in Ordinance)

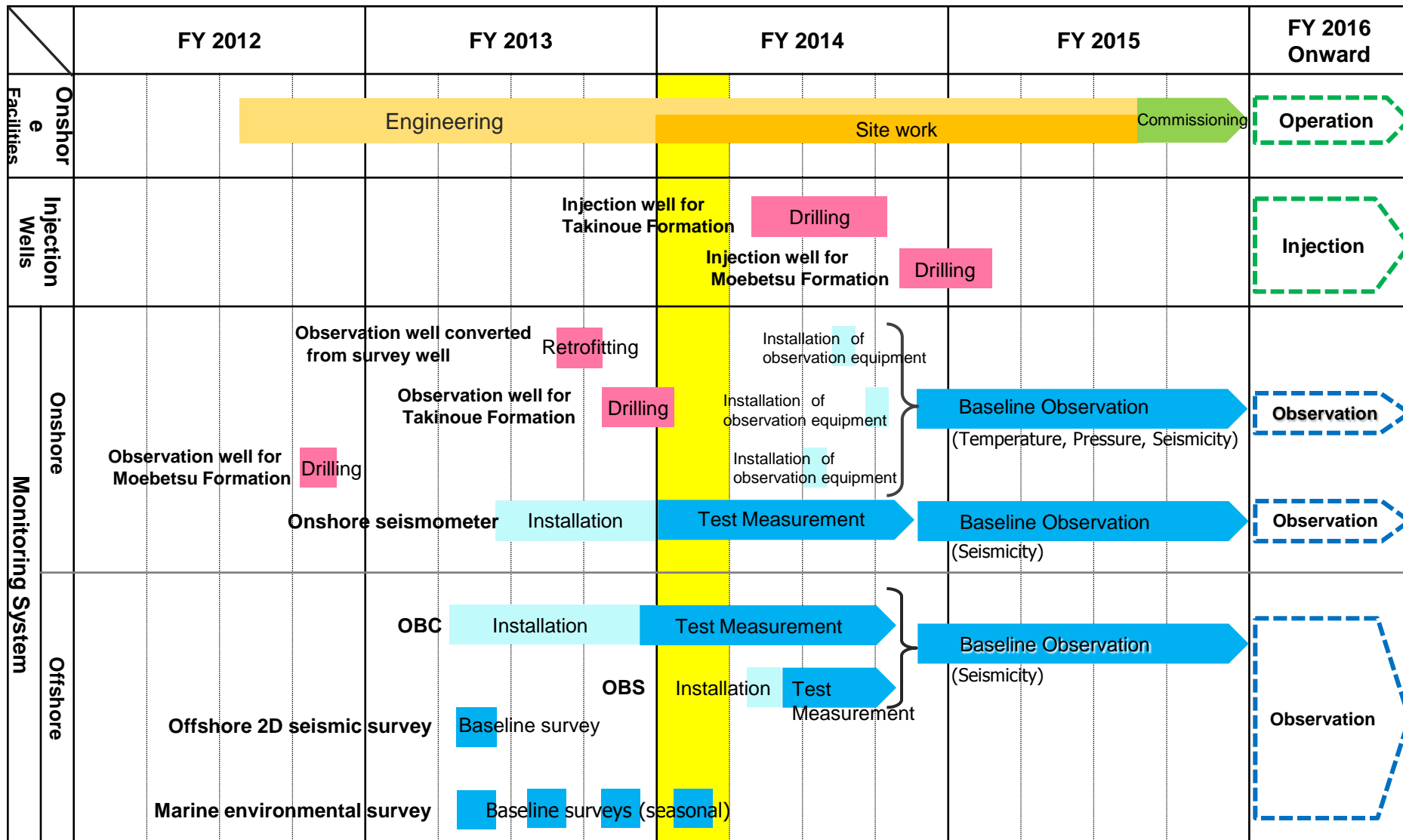
1. Monitoring under normal situation
2. Monitoring for possible CO₂ leakage
3. Monitoring for adverse impact in case of CO₂ leakage

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Future Plan of CCS Demonstration Project

We are here.

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.



Thank you for your attention.