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Task Force on Technical Barriers and R&D Opportunities for Offshore, Sub-Seabed Geologic Storage of Carbon Dioxide

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Technical Group Meeting

Regina, Canada

June 16, 2015

Purpose of Task Force

Identify technical barriers and R&D needs/opportunities for offshore, sub-seabed storage of carbon dioxide.

Background

- **November 2013: Washington, DC Ministerial Meeting:**
  - University of Texas-Bureau of Economic Geology presented to Technical and Policy Groups on Advancing Global Offshore CCS.
  - Ministerial Communique included reference to offshore storage since diverse suite of options will be necessary for CCS deployment.

Timeline of the Task Force

- ***February 2014: Task Force Proposal developed and included on CSLF Seoul Meeting Website.***
- ***March 25, 2014: Seoul, Korea Technical Group Meeting.***
- ***April 30, 2014: Membership Established/Finalized.***
- ***June 30, 2014: Outline of Report Drafted.***
- ***October 28, 2014: Progress/Status report at CSLF Technical Group Meeting.***
- ***June 2, 2015: First draft of report completed. Circulated to Task Force Members for comments and edits.***
- **July 17, 2015: Task Force Comments due.**
- **August 31, 2015: Report finalized.**

Report Outline and Structure

High-Level Report Outline

1. Introduction
2. Status and barriers of existing and proposed offshore CO2 storage and EOR Projects
3. Offshore CO2 Storage and EOR Resource Assessments
4. CO2 Transport for Offshore Storage
5. Risk Analysis for Offshore CO2 Storage
6. Wellbore Management
7. Monitoring, Verification, and Assessment Tools for Offshore Storage
8. Summary of Regulatory Requirements for Offshore Storage
9. Summary and Recommendations

General Structure of Chapters

- Status/Overview
- Barriers/Technical Challenges
- R&D Opportunities
- Recommendations

Offshore Large-Scale Integrated CCS Projects

Source: Global CCS Institute

Challenges and Barriers – Preliminary/High-Level

Challenges

- Protection of competing economic and environmental interests
- Accessibility
- Impact of CO_2 on marine ecosystems
- Operational challenges/Lack of infrastructure
- Financing

Saline Storage barriers

- Slow progress with large-scale onshore CO_2 capture projects
- Long-term storage of CO_2 storage in the offshore setting
- Long-term capacity for large-scale CO_2 storage in the offshore setting

EOR barriers

- A number of studies using different oil and CO_2 price assumptions
- Availability of CO_2 is a potential limiting factor
- Cost of converting existing installations
- Regulations: not a show-stopper, but varying levels of stringency in different countries

Benefits

- Geologic understanding of the offshore enhanced by O&G E&P info
- Capacity of the near-offshore is globally significant
- Single offshore owner and manager of both mineral and surface rights
- Offshore typically has few or no economic fresh-water aquifers
- Absence of population
- Existing pipeline rights-of-way for O&G production could facilitate infrastructure
- Potential to recommission offshore infrastructure
- For federally-owned storage resources, potential revenues
- Monitoring techniques are available – can be improved

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Preliminary Recommendations

Topic	Status/Description	Recommendation
Knowledge-Sharing	Narrow set of past R&D activities, but growing interest – need to leverage opportunities early and often	Increase knowledge sharing to define potential areas for international collaboration on offshore storage.
Storage Capacity Assessments	currently inadequate.	Pre-qualify storage locations, basin evaluation; knowledge sharing and int'l collaboration.
Transport Infrastructure	Limited and potentially expensive, but less exposure to issues around routing.	Optimization of current practices and infrastructure; take advantage of pilots and demos.
Offshore CO2-EOR	Only one project - Lula in Brazil. Possible to catalyze storage opportunities and infrastructure.	Recent advances in subsea separation and processing could extend the current level of utilization of sea bottom equipment to also include the handling of CO2 streams. Explore opportunities to leverage existing infrastructure and field tests.
Understanding of CO2 Impacts on the Subsea Environment	Significant body of research exists, but complexity of impacts and the challenges to efficient monitoring, particularly natural variability to correctly identify and quantify non-natural change.	Leverage existing work. Understand buffering potential of sediments, and the impact of longer term exposures. Modeling: CO2 dispersion and influencing factors, marine systems.
Monitoring Technology Development	Technology exists but room for improvements. Cover large areas and lengthy periods.	Data processing and interpretation for CO2 storage. The quantification of CO2 within a reservoir still remains a challenge. Real-time data retrieval and navigation. Further development in integrated in situ sensors.

Team Members

- Total team members: 28
- 6 countries, 4 continents
- Government agencies, universities, research laboratories, industry, non-governmental organizations