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# Report of the

# CSLF Task Force to Assess Progress on Technical Issues Affecting CCS

*(formerly Task Force to Assess Progress on Closing the Gaps)*

Working Group on Storage and Monitoring Status
Beijing, September 09, 2011

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# Process

- Based on the Gaps Analysis List, the WG on Storage prepared a modified list of gaps with 34 topics

- ”Questionnaire” was sent to 25 CSLF recognized projects with a storage component, including a list of questions:
  - Do you agree to the above list of gaps for your project, or should gaps be added or deleted from the list?
  - Would it be possible for you to let us have
    - The full objectives of the project, e.g. as stated in the application for funding?
    - The time schedule of the project with important milestones, original and, if relevant, revised?
    - A summary of the present status of your projects with emphasis on how far you have progressed towards the objectives and the gaps identified for your project?
    - Your opinion on any additional work that may be needed when the present project is completed?

# Responses

- Response received from 17 project as of September 09, 2011
- Responses varied in length from a few words for each topic to five pages reports
- Some projects completed under the CSLF recognition umbrella continue. The continuations will be included in the results

# Important lessons

- It was wise to change name of Task Force
- Large scale storage is happening and even larger projects have been approved and are under construction. Thus there are no real technical gaps. Therefore:
  - There are no technical showstoppers
  - A target is needed to really identify a gap
  - “Technical issues” are more relevant than “gaps” (better terminology)
  - There may be scientific gaps, but these are no showstoppers

- One respondent pointed this out
  - We don’t see any gaps that need closing for our project to proceed. At the end of the day the only real gap that the widespread deployment of CCS suffers from is that today it is terribly expensive and can’t compete with industries that continue to simply vent their emissions.
  - Perhaps reframe your question to one of what areas will the project provide further insights/technical demonstrations of the technology

# What is not being addressed by CSLF recognized projects?

## 1. Storage medium

- Unmineable coal seams:
  - Improve understanding the effects of coal rank, quality, stress and other properties on storage potential and capacity, and on injectivity
- Mineral carbonation:
  - Enhancing in-situ mineral trapping (basalts, etc.)
  - Enhanced trapping: Assessment of the techno-economic viability of mineral storage of $CO_2$
- Other geological formations
  - Improved understanding of the effect of oil and/or gas production from shales on storage integrity (confinement) and capacity

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## What is not being addressed by CSLF recognized projects?

### 2. Managing the storage site

- Improved understanding of, and ability to monitor and assess, the impacts of $CO_2$ leakage on ecosystems, including marine settings

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# What is not being addressed by CSLF recognized projects?

## 3. Guidelines development

- Development of protocols for assessing well material alteration and forward simulation of well barrier stability over time
- Development of guidelines and procedures for handling produced saline water at onshore as well as offshore sites in the case of engineered sites where water production is used for pressure and $CO_2$ plume control
- Consolidation of various “best practices” manuals developed or issued by various individual projects or agencies (e.g., Weyburn Project, NETL, IEA-GHG, etc.) into general sets under the auspices of an international agency or organization (e.g., CSLF, GCCSI, IEA, etc.).

# What storage topics receive most attention from CSLF-recognized projects? (1)

- Topics addressed by more than 10 projects, including those that have not responded:
  - Monitoring the storage complex
    - Development and application of low cost and sensitive monitoring technologies, including non-intrusive, passive and long term methods, remote sensing and autonomous sampling techniques, onshore and offshore (19 projects)
    - Combination and integration of a range of monitoring techniques to improve resolution, temporal as well as spatial, and reduce costs (17 projects)
    - Development and application of monitoring techniques and methodologies that allow for detection and quantification of subsurface leakage (17 projects)

# What storage topics receive most attention from CSLF-recognized projects? (2)

- Managing the storage site
  - Improvement and application of risk assessment tools
- Modelling the storage site
  - Further development of appropriate coupled models
- Outreach and public concern
  - Development of procedures and approaches for communicating the impacts and risks of geological storage to the general public, media and decision makers in the public and private sectors, from the initiation of a CCS project to its closure and liability transfer

# Example of response – further work

- Question 2d: Your opinion on any additional work that may be needed when the present project is completed?
- Answer
  - Studies that may complement/enhance our initiative can be:
    - Develop and test monitoring technologies for different
      - geological formations
      - depths (improving the upscaling)
      - $CO_2$ origins (robustness for detection)
    - study fracturing processes / effect of fractures, with respect to $CO_2$ (directly or indirectly) under controlled conditions
    - implement technology development into ongoing projects
    - further progress in geo-modelling based on results from this project
    - further develop and implement the protocol and certification scheme

# Further work

- Challenge: Find a short and easy-to-read presentation form, e.g.
  - ½ - 1 page desicription of how topics are addressed
  - Table summarising above
- Compile response
- Gather information from non-CSLF projects from available information?
- Prepare report by end 2011

# Preliminary Conclusions

1. Projects are addressing technical and deployment issues, not scientific issues and this should be reflected in the Project Recognition questionnaire
2. The Project Recognition questionnaire should be simplified
3. Focus areas relevant to projects and to advancement of $CO_2$ storage:
   a. Storage in unconventional media (coals, shales, basalts)
   b. Enhanced mineral trapping and mineralization
   c. Storage engineering for pressure and $CO_2$ plume control
   d. Monitoring technologies and leakage detection
   e. Effects, risks and remediation of leakage
   f. Site management
   g. Consolidation of various guidelines and “best practices” manuals
   h. Outreach, addressing public concerns, and educating the public and decision makers (political, regulatory, industry)

**The CSLF Technical Group should refocus its attention and activities in the next 5-10 years to implementation an deployment issues**

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# Special Thanks to

**Lars Ingolf Eide, Consultant**

**CLIMIT Programme**

**Research Council of Norway**

**For collecting, compiling and interpreting the replies from the CSLF-recognized projects**