



CSLF-T-2008-07

**Carbon Sequestration Leadership Forum (CSLF)
Minutes of the Technical Group Business Meeting
Cape Town, South Africa
16 April 2008**

LIST OF ATTENDEES

Technical Group Delegates

Australia:	John Kaldi, Clinton Foster
Brazil:	Paulo Rocha, Paulo Cunha
Canada:	Bill Reynen (Vice Chair), Stefan Bachu
European Commission:	Derek Taylor
France:	Christian Fouillac, Pierre Le Thiez
Germany:	Jürgen-Friedrich Hake
India:	Laxman Prasad (Vice Chair), Ishraq Ahmad
Italy:	Giuseppe Deriu, Fabrizio Pisanu
Japan:	Makoto Akai
Korea:	Chang-Keun Yi, Chong-Kul Ryu
Netherlands:	Harry Schreurs
Norway:	Trude Sundset (Chair), Jostein Dahl Karlsen
Saudi Arabia:	Abdulmuhsen Alsunaid
South Africa:	Fred Goede
United Kingdom:	Nick Otter
United States:	Victor Der, George Guthrie

IEA GHG Tim Dixon

CSLF Secretariat John Panek, Scott Miles

Observers

Aleksandra Kalinowski, Australia	Johann Clur, South Africa
Lincoln Paterson, Australia	Chris Gross, South Africa
Marcelo Ketzer, Brazil	Philip Lloyd, South Africa
Didier Bonijoly, France	Nikki Brajevich, United States
Claudia Vivalda, France	Howard Herzog, United States
Amir Mohammad Eslami, Iran	Lee Spangler, United States
Manuel Lemos de Sousa, Portugal	Paul White, United States
Marthinus Cloete, South Africa	

1. **Opening Remarks**

The Chair of the Technical Group, Trude Sundset of Norway, called the meeting to order and welcomed all delegates and observers. Ms. Sundset thanked South Africa's Organizing Committee and their support staff for their dedication and hard work in preparing for the meeting.

2. **Introduction of Delegates and Observers**

Technical Group delegates and observers present for the session introduced themselves. Sixteen of the twenty-two CSLF Members were represented at this meeting. Representatives from Australia, Brazil, Canada, the European Commission, France, Germany, India, Italy, Japan, Korea, the Netherlands, Norway, Saudi Arabia, South Africa, the United Kingdom, and the United States were in attendance. There were fourteen observers attending the meeting, representing seven countries.

3. **Adoption of Agenda**

The Agenda was adopted with no changes.

4. **Review and Approval of Minutes of Al Khobar Meeting**

Jürgen-Friedrich Hake of Germany requested a change to the section concerning linkage with the International Energy Agency (IEA) Greenhouse Gas R&D Programme (IEA GHG) under the Report from Project Interaction Review Team (PIRT) agenda item (Item #7 in the Al Khobar minutes) to clarify the discussion concerning proposal of new studies to the IEA GHG. The minutes now read, "The CSLF can propose new studies directly to the operating agent of the IEA Greenhouse Gas R&D Programme. The agent will handle all the details for the executive committee." This modification to the minutes clears up the misconception that a member can somehow bypass the procedure. The Technical Group minutes from the January 2008 meeting in Al Khobar, Saudi Arabia were amended and approved as final.

5. **Review of Al Khobar Meeting Action Items**

John Panek of the CSLF Secretariat reviewed the status of action items resulting from the Al Khobar Technical Group meeting.

The following action items have been completed:

- Secretariat: Preparation of a paper with the proposed modification to the Terms of Reference to be sent to the Policy Group for its approval at the Cape Town meeting.
- Secretariat and PIRT: Poll stakeholders about their interest in moving projects forward. Stakeholders were asked to share their reasons for putting forth projects or reasons against submitting projects for CSLF recognition.

- Secretariat: Development of additional categories under the capture element for CSLF projects.
- Secretariat and Australia: Prepare and distribute the report titled, “Technical and Societal Issues for Eco-Management of Land Use in Developing Storage Sites for Carbon Capture and Storage – An Australian Experience.”

The following action items are ongoing, in progress, or deferred:

- Chair: Submit a list of ideas for IEA GHG/CSLF collaboration to the 9th International Conference on Greenhouse Gas Technologies (GHGT-9), November 2008, Washington, D.C., United States. Recommended Task Forces submit papers to the conference. Support for the Capacity Building element to be held in conjunction with the conference.
- Chair: Establish a dialog with the Policy Group concerning CSLF recognition. The Chair will include this in the report to the Policy Group at the Joint Meeting.
- Chair: Recommend the Dynamis project for recognition to the Policy Group at the Cape Town meeting. The Chair will make a recommendation to the Policy Group at the Joint Meeting. A presentation on Dynamis to be made at the Joint Meeting

The following action items resulted from the Paris Joint Policy and Technical Group meeting and are ongoing:

- Technical Group: Identify policy and legal strategies and instruments needed for research needs. This is an open issue. The Technical Group Chair will report to the Joint Policy and Technical Group meeting.
- Technical Group: Develop mechanisms to involve emerging economies in industrialized country and lighthouse projects. This is an open issue. The Technical Group Chair will report to the Joint Policy and Technical Group meeting.

6. IEA Greenhouse Gas R&D Programme Update

The Chair called on Tim Dixon of the IEA GHG to provide an overview of the IEA GHG and the plans for a working relationship with the CSLF. The IEA GHG commissions studies into different areas focusing primarily on carbon capture and storage (CCS). To date, more than 100 of these studies have been produced. The IEA GHG is also runs six R&D networks: integrity, risk assessment, monitoring of CO₂ storage, oxycombustion, capture technologies, and biofixation. The IEA GHG includes nineteen country members of the IEA Greenhouse Gas Program plus the European Commission, and the Organization of Petroleum Exporting Countries (OPEC), and nineteen sponsor companies.

Many of the same countries and companies which are involved in the CSLF are also involved in the IEA GHG. An arrangement has been implemented to maximize the benefits and increase cooperation between the CSLF Technical

Group and the IEA GHG, including mutual representation at each other's meetings without any voting rights. Many Technical Group delegates already attend the IEA GHG Executive Committee meetings.

There is a three-stage process for the IEA GHG to generate projects and studies. The new arrangement allows the CSLF Technical Group to input proposal outlines into the first stage of this process. The second stage is a voting stage. And the third stage is more thorough consideration at the Executive Committee Meeting of full proposals. Once a proposal is approved and endorsed by the Executive Committee, the proposal is commissioned as a study.

The next IEA GHG Executive Committee meeting is in late April 2008 in Berlin, Germany. As a result of the CSLF Technical Group meeting in January, a proposal was put together by members of the Technical Group and submitted to the IEA GHG on storage capacity coefficients. This idea builds on the work of the CSLF Storage Capacity Estimation Task Force to develop a series of storage coefficients for geological reservoirs and characteristics. The new IEA GHG / CSLF relationship has already resulted in a new activity going forward. The proposal has progressed through the voting stage of the process and is now to be considered at the IEA GHG Executive Committee meeting in Berlin. This proposal tied with another proposal in receiving the highest number of votes.

There have been seven proposals which have progressed through the process. One of those proposed by IEA Greenhouse Gas Programme is entitled, "What Have We Learned to Date?" This study would look at the pilot and demonstration projects that are underway around the world, perform an assessment of their technical status, look at the knowledge gained, and identify gaps. This study goes beyond the work that the PIRT has done. Depending on the outcome of the IEA GHG Executive Committee, this study could lead to possibly some form of international or global network of global demonstration projects.

Mr. Dixon discussed the upcoming Greenhouse Gas Technology Conference, or GHGT-9, to be held in November in Washington, D.C., United States and being organized by the Massachusetts Institute of Technology (MIT). This conference is already proving of great interest to the target audience. About 900 abstract proposals have been submitted for the 200 paper places and the 400 poster slots that are available. This conference should be a successful event in presenting the latest work on all the different areas.

7. Update on the GHGT-9 Conference in Washington, D.C., United States, 16-20 November 2008

The Chair called on Howard Herzog of MIT to provide an update on the upcoming GHGT-9 conference. The conference will begin on Sunday, 16 November 2008 with a Welcoming Reception. The official conference will start on the morning of Monday, 17 November and run through Thursday, 20 November. The venue will be the Omni Shoreham Hotel in Washington, D.C., and about 1,500 people are expected to attend. Plans are being made to handle

additional attendees. As a comparison, the previous conference in Norway attracted about 1,000 people.

The audience was asked to register early for the conference and make their hotel reservations as soon as possible. The conference website www.mit.edu/ghgt9 is now open. The deadline for early registration is 15 August 2008. The cost of advanced registration is US\$895. After 15 August 2008, the fee increases to US\$1,395. Sponsorship of the conference from the U.S. Department of Energy and 24 industrial sponsors has been very strong. There is a reduced fee for students. The call for papers closed at the end of March 2008. A preliminary program will be ready and posted on the conference Web site at the end of June 2008.

Mr. Herzog has been working with Capacity Building Task Force Chair Judd Swift on including a capacity building activity in the conference.

8. Discussion of Technical Group Task Force Activities: Next Steps

Project Interaction and Review Team (PIRT)

Nick Otter of the United Kingdom, Chair of the PIRT, provided an update on the PIRT's activities. The PIRT has a core group and a floating group. The core group has the Chair and Vice Chairs of the Technical Group and other delegates as members. Representatives from the following members are involved: Australia, Canada, Denmark, the European Commission, Germany, India, the Netherlands, Norway, Saudi Arabia, the United Kingdom, and the United States. The floating group comprises representatives of CSLF recognized projects with overall management responsibility in the project (e.g., project manager), as well as other subject area experts.

The PIRT's tasks are:

- Assess projects proposed for recognition by the CSLF.
- Review CSLF project portfolio and identify synergies, complementarities and gaps, giving input for CSLF Road Map revision.
- Identify technology gaps where further RD&D would be required.
- Foster enhanced international collaboration for CSLF projects.
- Promote awareness within the CSLF of new developments in CCS.
- Organize periodic activities to facilitate exchange of experience and views on issues of common CCS interest.

The PIRT is undergoing an update of the CSLF Technology Roadmap. This effort is being headed by Pierre Le Thiez of France. The plan is to have a draft for review at the next Technical Group meeting in November 2008. The PIRT plans on having a meeting in September in Australia. The CSLF Technology Roadmap is out of date because so much has happened in the field of CCS during the four years since it was introduced. The schedule for completing an update of the CSLF Technology Roadmap is as follows:

- Issue initial draft to the PIRT April 30, 2008
- Receive comments from the PIRT June 2, 2008
- Revision of the first draft July 4, 2008
- Revision of the second draft August 1, 2008
- Meeting of the PIRT to agree to the second draft September 15–19, 2008
- Circulate draft to the Technical Group September 30, 2008
- Receive comments from the Technical Group October 31, 2008
- Review final version of the CSLF Technology Roadmap at Technical Group meeting November 16, 2008

The current CSLF project portfolio contains nineteen projects, three of which have been completed. The PIRT reviewed and recommended the Dynamis Project, sponsored by the European Commission and Norway, for CSLF recognition to the CSLF Technical Group at the Al Khobar meeting in January 2008. This project received the Technical Group's recommendation. Sixteen of the nineteen CSLF projects provided quarterly reports for the March 2008 Strategic Plan Implementation Report (SPIR).

The PIRT asked the Secretariat to poll stakeholders and project sponsors to try to quantify the value of CSLF recognition for projects. The survey ran from February to March 2008. The response rate for stakeholders was 10% (out of 120 stakeholders). Approximately 20% of project sponsors participated. Sponsors and stakeholders saw CSLF recognition as prestigious and it offered the chance to help shape policy. Survey respondents saw the administrative burden and difficulty in understanding the benefits of CSLF recognition as negatives. The Secretariat was directed to continue to try to collect additional feedback.

Jostein Dahl Karlsen of Norway suggested that the next Technical Group meeting could include a presentation or an update on the CSLF project portfolio in combination with presentations by individual projects. Following support from individual delegates, the Chair noted involving presentations by particular projects was a useful action to pursue in preparing for the next meeting.

Storage Capacity Estimation Task Force

Stefan Bachu of Canada, Chair of the Task Force, presented a status report on the Task Force's activities. Members include Australia, Brazil, Canada, the European Commission, France, Norway, the United Kingdom, and the United States. Dr. Bachu asked for, and received, Technical Group endorsement of the Phase III report. This report will be finalized and posted to the CSLF website. The Phase I and II reports have been widely used in the technical literature which shows that the work was needed and successful.

The Task Force was commended by several Technical Group delegates. Fred Goede of South Africa, Nick Otter of the United Kingdom, and George Guthrie of the United States complimented the Task Force for its excellent work.

The impact of the Task Force has been to provide clarity regarding various concepts related to CO₂ storage capacity. The methodology developed by the Task Force has been adopted and applied in various countries on different continents, such as Brazil in South America, India in Asia, and countries in Europe. The methodology is robust and consistent with similar approaches.

The Task Force has been assisting other task forces with their activities. One such example is assistance to the Capacity Building Task Force workshops. Task Force members will participate in the upcoming workshops planned in Mexico in July 2008 and Brazil in September 2008.

Dr. Bachu stated the Task Force has finished its work and requested that the Technical Group consider the work of the Storage Capacity Estimation Task Force completed. There was consensus by the Technical Group that the Task Force has successfully completed its work and is disbanded.

Risk Assessment Task Force

George Guthrie of the United States, Chair of the Task Force, provided a status report on the activities of the Risk Assessment Task Force. Task Force members include the Australia, Canada, France, India, Japan, the Netherlands, Norway, the United Kingdom, the United States, and the IEA GHG. Dr. Guthrie stated that the Task Force expects to have a draft of Phase I of its work completed prior to the next Technical Group meeting. Delegates should expect to receive a copy of this report in advance of the next meeting.

The draft of the Phase I report will contain a literature and methodology review of publicly available information on the assessment of risk in geological storage of CO₂. The Technical Group was asked for assistance regarding one element of the Task Force's work. The Task Force is seeking information on risk assessment related to CO₂ storage for ongoing and emerging projects. The Task Force has some of this information but it plans to circulate a request form to the Technical Group for response as soon as possible. The goal then is to combine this information together with a literature review of available information and a review of methodologies. Missing gaps in this information will be the focus of Phase II of the Task Force's work.

9. Introduction and Review of Possible Projects

Bill Reynen of Canada introduced two CCS projects which may be nominated for CSLF recognition by Canada in the future. The first is a C\$1.4 billion retrofit of SaskPower's Boundary Dam plant in southeastern Saskatchewan with CCS technologies. The second project involves a technology that is not currently in the CSLF's portfolio of recognized projects: acid gas injection into a saline aquifer at Fort Nelson in northeastern British Columbia.

10. Technical Group Views on Proposed CSLF Ministerial Meeting

The Chair began its discussion by stating that any decision to hold a CSLF Ministerial meeting rests with the Policy Group. There was indication that the

timeframe for a possible Ministerial meeting was the latter half of 2009. A Ministerial meeting is an opportunity to raise the CSLF's profile and attract more stakeholders.

Stefan Bachu shared his opinion that poster-type presentations of technical projects would be a way to best utilize Ministers' time while affording them the opportunity to gain a good understanding and overview of technical projects and activities. Asking Ministers to sit through a half day or a full day of discussions or oral presentations was seen as too time-consuming given the Ministers' limited time. Dr. Bachu felt that the CSLF was overdue for a Ministerial meeting.

India stated its preference for holding a Ministerial meeting close to a location of one of the CSLF recognized projects. This would afford the CSLF the opportunity to conduct a site visit so that Ministers could better understand the technologies being advanced by the CSLF.

Australia indicated that some meaningful announcement in the area of CCS would be needed to warrant a Ministerial meeting. Australia's view is that substantial progress would be needed before it would be supportive of a Ministerial meeting.

Bill Reynen, Nick Otter, and Dr. Bachu stated that they expect that some of the CSLF recognized projects are expected to have significant progress over the next 18 months prior to the Ministerial meeting. Having large-scale demonstration projects in operation will provide some real visibility. Mr. Otter felt that the United Kingdom, by the end of 2009, should be in a position to make an important announcement on one of its demonstration projects. The United States will be starting nine projects and Canada five within the next year. Mr. Otter expects the European Union to be in a position in the near future to make a significant announcement. Together these activities would support a Ministerial meeting.

Victor Der of the United States and Jostein Dahl Karlsen shared the position that the CSLF Policy Group would drive the decision on whether or not to hold a Ministerial meeting and that the Technical Group should be consulted in the matter.

11. CO2CRC Otway Project Presentation

John Kaldi of Australia gave an introduction to a video presentation on the CO2CRC Otway Project. The project is Australia's only operational CO₂ storage project with monitoring and verification of the stored CO₂. In April 2008, the project began injecting CO₂ at a rate of about 150 tons per day, and the project expects to inject 100,000 tons of CO₂ over the next two years. The total cost is expected to be \$40 million with contributions from industry and research partners. The location of the project is in the State of Victoria in Southeast Australia.

Otway Basin was selected due to the following benefits:

- A source of carbon dioxide
- Oil and gas tenements available at an affordable price
- Large amount of exploration and production data

- Infrastructure in place
- Proven containment (gas demonstrably trapped over geological periods of time)
- Community familiar with the oil industry (good & bad)
- Accessible
- Geology suitable for required storage capacity

The video is to be made available on the CSLF website:

<http://www.cslforum.org/projects.htm>

12. Recommendation of Agenda Items for Next Technical Group Meeting

There was consensus that the Technical Group hold its next meeting in Washington, D.C., United States, on 16 November 2008, the day prior to start of the GHGT-9 conference. Washington, D.C. in November was seen as an attractive site and time, as many sponsors of existing CSLF recognized projects and prospective CSLF projects and many CSLF Technical Group delegates will be attending the GHGT-9 conference.

13. New Business

At the Al Khobar Technical Group meeting in January 2008, the Australian delegation submitted a room document on a concept for student body involvement in the CSLF. There was broad support for the idea, but a decision on moving forward with the concept was not reached.

The idea was seen as being consistent with the successful IEA GHG Summer School activity. The concept was also seen as consistent with the activities of the Capacity Building Task Force. It was decided that a working group of interested parties was to be formed to address the student body initiative. Italy, the Netherlands, the United Kingdom, the United States, and the IEA GHG volunteered to be part of the working group.

14. Review of New Action Items

New action items resulting from this meeting were reviewed and are listed below.

Action Items arising from Cape Town Technical Group Meeting

Item	Lead	Action
1	Secretariat	Pending selection of the storage capacity coefficients project proposal by the IEA GHG, request access for CSLF delegates for the project's final report.
2	PIRT	Prepare the schedule for the update to the CSLF Technology Roadmap.
3	Secretariat	Follow-up with non-responders to the CSLF stakeholder and project sponsor surveys.
4	PIRT and Secretariat	Prepare detailed status report on CSLF projects for the next meeting.
5	Secretariat	Post the Phase III report of the Storage Capacity Estimation Task Force to the CSLF website.
6	Australia, Italy, the Netherlands, the United Kingdom, the United States, and the IEA GHG	Identify points of contact from each Student Body Working Group member.
7	Secretariat	Circulate a Risk Assessment Task Force request form to the Technical Group delegates for response by the end of June.