



CSLF-T-2006-6

**Carbon Sequestration Leadership Forum  
Minutes of the Technical Group Meeting  
Delhi, India  
3 April 2006**

**LIST OF ATTENDEES**

**Technical Group Delegates**

Australia:	John Bradshaw, Andy Rigg
Brazil:	Paulo Cunha, Paulo Rocha
Canada:	Bill Reynen (Vice Chair), Stefan Bachu
China	Chen Wenying
Denmark	Flemming Ole Rasmussen
European Commission:	Denis O'Brien, Derek Taylor
France:	Christian Fouillac, Pierre Le Thiez
Germany:	Volker Breme
India:	R.R. Sonde, Malti Goel
Italy	Giuseppe Girardi
Japan:	Tsukasa Kumagai
Korea	Chang-keun Yi, Chong Kul Ryu
Netherlands:	Daniel Jansen
Norway:	Trude Sundset (Vice Chair), Jostein Dahl Karlsen
Russia	Gurgen Olkhovsky, Dmitry Volokhov
Saudi Arabia	Mohammad Alzayer
South Africa	Jeffery Kgobane
United Kingdom:	Nicholas Otter, Stephen Cornelius
United States:	Victor Der (Chair), Howard Herzog

**CSLF Secretariat**

John Panek  
Scott Miles

**Invited Speakers**

Sally Benson (U.S. Lawrence Berkeley National Laboratory, representing CSLF Stakeholders)

Joseph Giove (U.S. Department of Energy)

Arthur Lee (Chevron, representing CSLF Stakeholders)

Svend Søyland (Bellona, Norway, representing CSLF Stakeholders)

Nicholas Otter (Alstom Power Ltd., representing CSLF Stakeholders)

Geir Vollsæter (A/S Norske Shell, representing CSLF Stakeholders)

**Observers**

William Koppe, Australia

Prakash Hirani, India

Ajay Kumar Jain, India

Sujay Karmakar, India

D. Ravi Kumar, India

Prakash Kumar, India

R. Mukhopadhyay, India

K. Bhanu Prakash, India

P. Sharma, India

K.P. Singh, India

U.P. Singh, India

Giovanni Ciceri, Italy

Giuseppi Deriu, Italy

Sergio Persoglia, Italy

Fabrizio Pisanu, Italy

Cinzia Tonci, Italy

Anatoly Rubin, Russia

Lee Spangler, United States

## **Technical Group Meeting of 3 April 2006**

### **1. Opening Remarks / Welcome**

The Chairman of the Technical Group, Dr. Victor Der of the United States, called the meeting to order and thanked India for hosting this meeting.

### **2. Introduction of Delegates**

Technical Group delegates present for the session introduced themselves. Nineteen of the twenty-two CSLF Members were represented at this meeting.

### **3. Adoption of Agenda**

The Agenda was adopted with the following changes and annotations:

- The Agenda item for Introduction of Possible Projects will include short presentations of possible projects by Australia, Canada, and Russia.
- The Statement of the Chair will include and be combined with the Agenda item for Overview of Technical Group Activities.

### **4. Statement of the Chair and Overview of Technical Group Activities**

Dr. Der briefly reviewed recent progress of the Technical Group, in the areas of development of a Technology Roadmap, recognition of 17 collaborative projects by the Policy Group, initial work of three Task Forces for identifying technology gaps, and development of a Projects Interaction and Review Team (PIRT). He stated that reports from some of the Task Forces and the PIRT, which held a preliminary meeting on 2 April, have been scheduled for this meeting. Dr. Der noted that a Developing Countries Task Force was formed at the Berlin Meeting in September 2005, but that the need for this Task Force should now be addressed, since a Capacity Building Task Force was formed by the Policy Group to examine many of the same issues. Finally, Dr. Der also mentioned that ideas for new activities for the Technical Group are needed.

### **5. Review and Approval of Minutes of Berlin Meeting**

The Technical Group minutes from the September 2005 CSLF meeting in Berlin, Germany, were approved with the following change: Trude Sundset from Norway should be added to the list of delegates present at the Berlin Technical Group meeting.

### **6. Secretariat Reports and Updates**

John Panek of the CSLF Secretariat delivered a presentation that described several areas of Secretariat activities since the Berlin meeting:

- Public Outreach Template
- Stakeholder Registry
- CSLF Website Changes
- Website Links Criteria and Disclaimer

Concerning the Stakeholders Registry, Mr. Panek mentioned that there have only been ten Stakeholders registered so far and that more are needed.

## **7. Reports and Updates from Technical Group PIRT and Task Forces**

Nick Otter of the United Kingdom delivered a presentation about the PIRT that provided background and progress to date. The PIRT governance consists of a Core Group (presently represented by Australia, Canada, Denmark, European Commission, Germany, India, Norway, the United Kingdom, and the United States) and a Floating Group that will be made up of representatives from the 17 recognized projects and subject area experts. Two key actions were identified by the PIRT Core Group: completion of a comprehensive technology gap assessment and examination of CSLF project selection criteria. The gap assessment will utilize the Floating Group expertise to identify areas where CSLF projects can be encouraged with an aim toward holding a workshop to determine what expertise could be brought to bear to fill those gaps. The next meeting of the PIRT will be held 23 June 2006 at Trondheim, Norway, in conjunction with the 8th International Conference on Greenhouse Gas Control Technologies (GHGT-8). There was consensus by the Technical Group to endorse the formation of the PIRT, as well as agreement on the PIRT's proposed format and structure, and agreement on the PIRT's activity plan. Membership and rotation of leadership was also agreed to and Dr. Der encouraged additional participation in the PIRT from emerging economies CSLF Members. The ensuing discussion about the metrics of "project selection" focused on Guideline #6 and the definition for "starting" a project. Consensus was reached on a proposal made by Australia that each project must have satisfied all of the following criteria in order to be considered as having "started" before it is put up to the Policy Group:

- Progressed through the early phases of project planning, such as (but not exclusively), documenting the project scope, outputs, and outcomes;
- Identified the magnitude of resource requirements sufficient to achieve the major milestones of the project;
- Identified funding sources; and,
- Pursuant to the financial implications contained within the above, that the two or more CSLF members collaborating on the project and submitting it for CSLF recognition commit that the project in its current form and status is likely to be capable of meeting major milestones prior to the expiration of the CSLF Charter (currently 2013).

Bill Reynen of Canada delivered an update presentation on the activities of the Task Force to Identify Gaps in Measurement, Monitoring and Verification of Storage (MMV). Rather than engage in a duplication of effort with the International Energy Agency's Greenhouse Gas Programme (IEA GHG), the Task Force chose to review the methodology in this area employed by IEA GHG, whose analysis was aimed at accomplishing two goals:

- Identifying the relative significance of the gaps identified in the IPCC Special Report on CO<sub>2</sub> Capture and Storage; and,
- Identifying key research needs that the IEA GHG can conduct or their members can undertake as part of their research activities.

Results of the IEA GHG analysis showed that most gaps are technical in nature, and that many of the gaps have in fact been addressed since the drafting process for the report began. The Task Force will request approval from IEA GHG to post their analysis on the CSLF website. The ensuing discussion led to the following consensus:

- The Task Force report was accepted and the MMV Task Force will be dissolved after posting of the results on the CSLF website; and,
- The Technical Group will consider revisiting the issue in the future, as necessary, with the recognition that gap analysis is evolving.

There was no report from the Task Force to Identify Gaps in CO<sub>2</sub> Capture and Transport. The draft report is still being considered to accommodate comments from other members of the Technical Group. Consensus was reached that there should be expeditious resolution of outstanding issues so that the report can be brought before the Technical Group at its next meeting.

There was no report from the Task Force to Identify Standards for CO<sub>2</sub> Storage Capacity Measurement.

## **8. Stakeholder Activity Presentations**

The following Stakeholders delivered short presentations:

- Dr. Sally Benson (Lawrence Berkeley National Laboratory, United States), "Facilitating Collaboration in R&D for Geological Storage"
- Joseph Giove (United States Department of Energy), "Status of the FutureGen Zero Emission Coal Power Plant"
- Svend Søyland (Bellona, Norway), "Missing Knowledge"
- Arthur Lee (Chevron, United States), "Priority Issues for Industry"
- Nicholas Otter (Alstom Power Ltd., United Kingdom), "EC/EU DYNAMIS Project: Towards Zero Emission Power Generation and Hydrogen"

- Geir Vollsæter (A/S Norske Shell, Norway), “Ground-breaking Industry and Environment Project, an Industrial Model for a CO<sub>2</sub> Value Chain in Norway”

## 9. Discussion of Work Plan

Consensus was reached that a Developing Countries Task Force should not be formed until guidance is received from the Policy Group, as a Capacity Building Task Force was formed by the Policy Group to examine many of the same issues. However, Saudi Arabia was selected to be a liaison from the Technical Group for this activity pending clarification from the Policy Group. Subsequently, it was decided to put formation of this Task Force on hold; instead, Saudi Arabia, with support from Australia and the United States, will review the Policy Group Capacity Building Task Force’s proposed work plan to determine what areas would be appropriate for participation by the Technical Group.

Consensus was reached on five items that will be included in the Technical Group’s Work Plan:

- Completion of report from the Task Force to Identify Gaps in CO<sub>2</sub> Capture and Transport,
- Planning for a Workshop on Identifying Key Obstacles to Implementation of CCS in conjunction with the next CSLF meeting,
- Progress Report from the Task Force to Identify Standards for CO<sub>2</sub> Storage Capacity Measurement,
- Presentation to Policy Group identifying permitting issues requiring policy guidance, and,
- Progress report from PIRT.

## 10. Introduction of Possible Projects

Four projects were introduced and described, for informational purposes only. These may be proposed for CSLF recognition at a future meeting. The projects are:

- Monash Energy Project. Bill Koppe of Anglo Coal made a short presentation about this project, which will capture CO<sub>2</sub> from coal-fueled power production in the Latrobe Valley of southeastern Australia and utilize it for enhanced oil recovery at nearby offshore oil fields. As much as 50 million tonnes per year of CO<sub>2</sub> storage is possible.
- Otway Basin Pilot Project. Dr. Andy Rigg of Australia’s Cooperative Research Centre for Greenhouse Gas Technologies made a short presentation about this project, which will include separation of CO<sub>2</sub> from natural gas production in the Otway Basin of southeastern Australia, transport of the CO<sub>2</sub> from source to sink, injection of the CO<sub>2</sub> into a depleted gas field, and monitoring/modeling of CO<sub>2</sub> migration. As much

as 100,000 tonnes of CO<sub>2</sub> will be separated and stored over a 1-2 year period.

- Joint Canada–U.S. Monitoring Project of the Zama Acid Gas Enhanced Oil Recovery Pilot Project. Dr. Stefan Bachu of the Alberta Energy and Utilities Board made a short presentation about this project, located in northwestern Alberta, Canada, which would monitor the use of an available acid gas stream (consisting of 70% CO<sub>2</sub> and 30% hydrogen sulfide) for enhanced oil recovery (via vertical displacement) at the nearby Zama oil field. As much as 100 tonnes per day of the acid gas would be injected over a 10-15 year period.
- First Corporate Project of Greenhouse Gas Emissions Reduction in Russian Coal Industry. Dmitry Volokhov of the Siberian Coal Energy Company made a short presentation about this project, still in the feasibility study stage, which would capture CO<sub>2</sub> from underground coal gasification or other sources and utilize it for enhanced coal bed methane recovery at closed or depleted coal mines in Russia. A full-scale project could result in CO<sub>2</sub> storage of up to 100 million cubic meters per year.

## **11. Election of Chair and Vice Chairs**

Trude Sundset of Norway was unanimously elected to a three-year term as Technical Group Chairman. Bill Reynen of Canada and Dr. Malti Goel of India were unanimously elected to three-year terms as Technical Group Vice Chairs.

## **12. New Business**

There was no new business.

## Appendix A

### Technical Group Action Items Arising from Delhi Meeting

Item	Lead	Action
1	Task Force to Identify Gaps in CO <sub>2</sub> Capture and Transport	Completion of discussion paper with resolution of all outstanding issues and incorporation of comments, as appropriate, of other Technical Group delegates
2	Task Force to Identify Standards for CO <sub>2</sub> Storage Capacity Measurement	Completion of progress report
3	PIRT	Completion of progress report
4	Chair, Vice Chairs, Secretariat	Development of plan for a Workshop on Identifying Key Obstacles to Implementation of CCS that would be held in conjunction with next CSLF meeting
5	Chair, Vice Chairs	Development of presentation to Policy Group identifying permitting issues requiring policy guidance
6	Saudi Arabia (lead), Australia, United States	Review of the Policy Group Capacity Building Task Force's proposed work plan to determine what areas would be appropriate for participation by the Technical Group