Carbon Sequestration leadership forum

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REVISED DRAFT

MEETING SUMMARY

Projects Interaction and Review Team (PIRT) Meeting

Beijing, China

19 September 2011

Prepared by the CSLF Secretariat

LIST OF ATTENDEES

Brazil:	Viviana Coelho, Beatriz Espinosa
Canada:	Stefan Bachu (Acting Chair), Eddy Chui
China:	Xiaochun Li, Jianghua Chen, Ruina Xu, Shu Wang, Jingrui Niu
European Commission:	Jeroen Schuppers
France:	Didier Bonijoly
Germany:	Jürgen-Friedrich Hake
Italy:	Giuseppe Girardi, Sergio Persoglia, Liliana Panei
Japan:	Ryo Kubo
Netherlands:	Harry Schreurs
Norway:	Trygve Riis
Saudi Arabia:	Khalid Abuleif
United Kingdom:	Philip Sharman, Gary Kirby, Peter Holland-Lloyd
United States:	George Guthrie, Joseph Giove, John Grasser
Global CCS Institute:	Mike Miyagawa
IEA GHG:	Tim Dixon
CSLF Secretariat:	John Panek, Richard Lynch, Matt Gebert

1. Welcome and Summary of Previous PIRT Meeting

PIRT Chairman Clinton Foster could not be present for the meeting, so Acting Chairman Stefan Bachu welcomed participants to the 16th meeting of the PIRT and provided a brief summary of the May 2011 PIRT meeting in Edmonton, Alberta, Canada. There were three main consensus issues adopted at the Edmonton meeting:

- Separation of the Task Force to Assess Progress on Technical Issues Affecting Carbon Capture and Storage (CCS) from the PIRT (it will now report directly to the Technical Group);
- Recommendation that the Zero Emission Porto Tolle Project and the Jänschwalde Project be approved by the Technical Group; and
- Agreement on a new procedure for consideration of projects nominated for CSLF recognition.

2. Adoption of Meeting Agenda

The meeting Agenda was adopted after there was consensus that Item #8 of the Agenda (Update of CSLF Project Submission Form) be combined with Item #6 (Discussion of CSLF Project Recognition Procedures).

3. Introduction of Meeting Attendees

PIRT meeting attendees introduced themselves. In all, twelve countries and the European Commission were represented at the meeting. Participants also included representatives from the Global CCS Institute and the IEA Greenhouse Gas R&D Programme (IEA GHG).

4. Approval of Meeting Summary from Edmonton PIRT Meeting

The Meeting Summary from the May 2011 PIRT meeting in Edmonton was approved as final with no changes.

5. Review of Action Items from Edmonton Meeting

Dr. Bachu briefly reviewed the status of the action items from the Edmonton meeting. Four of the items concerned the Task Force to Assess Progress on Technical Issues Affecting CCS (which at that time had not yet been fully separated from the PIRT), while two other items concerned the PIRT itself.

The first of the PIRT-specific actions was that the CSLF Secretariat should send out reminders to CSLF Members who have not yet provided their countries' CCS activities updates for 2011 CSLF Technology Roadmap. John Panek reported that this had been done and that the Secretariat appreciated the work of CSLF delegates in providing information for the Roadmap.

The second PIRT-specific action was that Dr. Foster would develop a draft of a revised Project Submission Form, including a simplified Gaps Checklist. Mr. Panek reported that Dr. Foster has completed this activity. There was agreement to defer discussion of this item until later in the meeting.

6. Review and Approval of Projects Nominated for CSLF Recognition

The following four projects had been nominated for CSLF recognition:

- Rotterdam Opslag en Afvang Demonstratieproject (nominated by the Netherlands and the European Commission)
- CGS Europe Project (nominated by France, Italy, Norway, and the European Commission)
- SaskPower Integrated CCS Demonstration Project at Boundary Dam Unit 3 (nominated by Canada and the United States)
- CO_2 Capture Project – Phase 3 (nominated by the United Kingdom and the United States)

Presentations on each of these projects were made by representatives of the project sponsors.

<u>Rotterdam Opslag en Afvang Demonstratieproject (ROAD)</u>

Harry Schreurs, speaking for the project consortium, provided a presentation about the project. This is a large-scale integrated project, located near the city of Rotterdam in the Netherlands, which includes CO_2 capture from a coal-fueled power plant, pipeline

transportation of the CO_2, and offshore storage of the CO_2 in a depleted natural gas reservoir beneath the seabed of the North Sea (approximately 20 kilometers from the power plant). The goal of the project is to demonstrate the feasibility of a large-scale, integrated CCS project while addressing the various technical, legal, economic, organizational, and societal aspects of the project. ROAD will result in the capture and storage of approximately 1.1 million tonnes of CO_2 annually over a five year span starting in 2015. Subsequent commercial operation is anticipated, and there will be continuous knowledge sharing. This project has received financial support from the European Energy Programme for Recovery (EEPR), the Dutch Government, and the Global CCS Institute, and is a component of the Rotterdam Climate Initiative CO_2 Transportation Network.

After brief discussion, there was consensus to recommend that the project be approved by the Technical Group.

CGS Europe Project

Gary Kirby from the British Geological Survey, speaking for the project consortium, provided a presentation about the project. This is a collaborative venture, involving 35 partners from participant countries in Europe, with extensive structured networking, knowledge transfer, and information exchange. A goal of the project is to create a durable network of experts in CO_2 geological storage and a centralized knowledge base which will provide an independent source of information for European and international stakeholders. The CGS Europe Project is intended to provide an information pathway toward large-scale implementation of CO_2 geological storage throughout Europe. This is intended to be a three-year project, starting in November 2011, and has received financial support from the European Commission's 7^{th} Framework Programme (FP7).

There was discussion on the similarity and differences between this project and CO_2 GeoNet, which is already a CSLF-recognized project. Dr. Kirby indicated that most likely CO_2 GeoNet will fold into the CGS Europe Project. In the end, there was consensus to recommend that the project be approved by the Technical Group.

SaskPower Integrated CCS Demonstration Project at Boundary Dam Unit 3

Dr. Bachu, speaking for project sponsor SaskPower, provided a presentation about the project. This is a large-scale project, located in the southeastern corner of Saskatchewan Province in Canada, which will be the first application of full stream CO_2 recovery from flue gas of a 139 megawatt coal-fueled power plant unit. A major goal is to demonstrate that a post-combustion CO_2 capture retrofit on a commercial power plant can achieve optimal integration with the thermodynamic power cycle and with power production at full commercial scale. The project will result in capture of approximately one million tonnes of CO_2 per year, which will be sold to oil producers for enhanced oil recovery (EOR) and injected into a deep saline aquifer. Commissioning of the reconfigured power plant unit is expected by early 2014. The project has received financial support from the Government of Canada and the Saskatchewan Provincial Government, and SaskPower is investing additional funds for refurbishment of the power plant unit and installation of the CO_2 capture system.

After brief discussion, there was consensus to recommend that the project be approved by the Technical Group.

CO_2 Capture Project – Phase 3

Philip Sharman, speaking for the project consortium, provided a presentation about the current third phase of the CO_2 Capture Project. This is a collaborative venture of seven partner companies (international oil and gas producers) plus the Electric Power Research Institute. The overall goals of the project are to increase technical and cost knowledge associated with CO_2 capture technologies, to reduce CO_2 capture costs by 20-30%, to quantify remaining assurance issues surrounding geological storage of CO_2, and to validate cost-effectiveness of monitoring technologies. The project is comprised of four areas: CO_2 Capture; Storage Monitoring & Verification; Policy & Incentives; and Communications. A fifth activity, in support of these four teams, is Economic Modeling. This third phase of the CO_2 Capture Project will include at least two field demonstrations of CO_2 capture technologies and a series of monitoring field trials in order to obtain a clearer understanding of how to monitor CO_2 in the subsurface. Third phase activities began in 2009 and are expected to continue into 2013. Financial support is being provided by project consortium members.

After brief discussion, there was consensus to recommend that the project be approved by the Technical Group.

7. Discussion of CSLF Project Recognition Procedures

Dr. Foster had developed a proposed new Project Submission Form, including a simplified one-page Gaps Checklist, in advance of this PIRT meeting. Mr. Panek provided background information that at the previous PIRT meeting in Edmonton, there was agreement that the existing and much longer Gaps Checklist needed revision as it was not achieving its intended purpose. The great amount of detail in the existing Gaps Checklist had resulted in projects with similar scopes providing greatly different information on technology gaps they were addressing. Dr. Bachu made the comment that the new Gaps Checklist was a step in the right direction, but that it may have gone too far in terms of simplification. Richard Lynch suggested that the new Gaps Checklist, if it were renamed, could serve as a good listing of Project Elements in a revised Project Submission Form. Dr. Bachu stated that the previous PIRT meeting had endorsed the concept of two parallel Gaps Checklists, a simplified one that would be used for project recognition purposes and a more detailed one that would be used for gaps analysis. Dr. Bachu also made the comment that the challenge was in getting information from the simplified Gaps Checklist to assess what technology gaps are being addressed by the project applying for CSLF recognition. In the end, there was no consensus to adopt the new Project Submission Form at this time; the PIRT would instead take this up again at its next meeting. In the meantime, the Chairman and four Working Group Leaders of the Task Force to Assess Progress on Technical Issues Affecting CCS were requested to jointly develop the parallel Gaps Checklists concept and provide a recommendation on how to proceed.

There was also discussion on how to categorize CSLF-recognized projects. This discussion was prompted by the fact that several projects previously recognized by the CSLF have not gone forward for various reasons. To date, the Secretariat has been using three informal groupings for recognized projects:

- Projects that have been completed;
- Projects that are still active; and
- Projects that are inactive.

Mr. Panek mentioned that the CSLF does not have a procedure for de-recognizing any projects that have been canceled or that for whatever reason have not gone forward. Also, since CSLF recognition is provided by the Policy Group, only the Policy Group can de-recognize a project. After ensuing discussion, there was consensus to adopt four official project classifications: "Completed", "Active", "Inactive", and "Withdrawn by Sponsor". A project will be entered into the "Withdrawn by Sponsor" category only upon formal notification by the project proponents, and not at CSLF initiative.

8. Discussion of Proposed Technical Group Action Plan

Prior to this PIRT meeting the Secretariat had provided Technical Group delegates an electronic copy of the proposed Technical Group Action Plan, so Dr. Bachu asked for discussion of the document. Mr. Sharman stated that although some of the twelve proposed Actions were commendable, there were several others which were already being addressed by outside organizations and that the Technical Group should not, in effect, replicate what these other organizations were doing. The majority opinion, however, was that the Technical Group should not immediately outright dismiss any of the twelve proposed Actions. Jürgen-Friedrich Hake stated that by not considering all of the Actions in the Plan, the CSLF would be opting out of its mandate to promote the appropriate technical environment for the development of CCS. Khalid Abuleif offered that the CSLF has as valid a point of view as these outside organizations and that if nothing else, the Technical Group can make assessments of the results from these organizations. Trygve Riis stated that probably every one of the twelve proposed Actions was being looked at by other organizations but the Technical Group with its world-class expertise could still have a leading role for certain topics. Dr. Bachu stated that the Technical Group would fade into irrelevance if it did not take an active role and left it to other organizations to act on CCS issues. After further discussion, there was agreement that the twelve Actions in the Plan needed prioritization. To that end, the Secretariat was asked to circulate, by the end of the first week of October, a listing of the twelve Actions to Technical Group delegates with the request that that each CSLF Member provide a ranking by priority of importance. Delegates will be asked to respond within three weeks and the results will be then compiled by the Secretariat. Results from this survey will then be used to decide which Actions to undertake immediately and which ones to defer, with the caveat that if no delegates were willing to undertake work on an Action, that Action will be deferred even if it was ranked high priority. The Secretariat was also asked to solicit ideas for additional Actions from the delegates.

9. Review of Plan for 2012 CSLF Technology Roadmap

Dr. Bachu commended the Secretariat for its work in completing the 2011 Technology Roadmap (TRM). Mr. Panek, in turn, expressed his appreciation to the Technical Group delegates and others who provided updates to their country-specific CCS activities for Module 2 of the TRM. Mr. Panek and Mr. Lynch both described the difficulty in keeping Module 2 current based on the large amount of CCS-related activities in progress worldwide. After ensuing discussion, there was consensus that these country-specific activities should not be included in future versions of the TRM and that the Secretariat should migrate all country-specific activities in Module 2 to the "CSLF Members" section of the CSLF website. It was agreed that this "Country Specific" list of CCS activities should be updated annually, and that the Secretariat should initiate this annual update by asking delegates for individual country updates.

There was also discussion on the timing for future revisions of the TRM. Both Dr. Bachu and Mr. Riis noted that the 2011 TRM was mostly a minor revision of the 2010 TRM, in that the only Module with significant changes was Module 2. There was consensus that a major update will soon be needed to revise the gaps identification information presently shown in Module 3 and the key milestones information in the current Module 4. To accomplish TRM updates in an orderly fashion, there was consensus that major updates should be done on a three-year cycle, and that the 2010 TRM represented the first year of such a cycle (since the 2011 TRM was a relatively minor update of the 2010 TRM). Therefore, the next major update of the TRM is due in 2013.

10. Planning for Future Technical Workshops

Dr. Foster, prior to this meeting, had developed four questions that pertain to any future CSLF Technical Workshops:

- What is the purpose?
- What would be possible subjects?
- What should be their frequency?
- Who will organize them, provide logistics support and funding?

Ensuing discussion resulted in consensus on the following:

- Technical Workshops are an essential activity of the PIRT and Technical Group.
- The desired frequency for these Workshops is at least one per year.
- The PIRT and Technical Group should be opportunistic in terms of scheduling and subjects of interest for future Workshops by taking advantage of other meetings where delegates are likely to be present, thus alleviating the logistics and costs of such workshops.

In regards to the third point, the intent is that future Workshops should be planned to take advantage of any related CCS event taking place at about the same time and location. To that end, Mr. Panek announced that a Workshop has been scheduled for November 3 in London, and will be co-sponsored with the Global CCS Institute. The theme of the Workshop is "Project Integration" and a draft agenda has been prepared by the Global CCS Institute.

11. New Business

There was no new business.

12. Adjourn

Dr. Bachu thanked the attendees for their patience and participation and adjourned the meeting.

<u>Summary of Consensus Reached</u>

- The following four projects were approved by the PIRT and (along with previously approved Wandoan Project) were sent forward to the Technical Group for its consideration:
    - Rotterdam Opslag en Afvang Demonstratieproject (ROAD)
    - CGS Europe Project
    - SaskPower Integrated CCS Demonstration Project at Boundary Dam Unit 3
    - CO_2 Capture Project – Phase 3

- Consideration of the proposed new Project Submission Form and revised Gaps Checklist was deferred to the next PIRT meeting.
- Four official classifications were adopted for CSLF-recognized projects: "Completed", "Active", "Inactive", and "Withdrawn by Sponsor".
- The twelve proposed Actions in the Technology Group Action Plan are to be prioritized in order of importance by CSLF Members.
- Country-specific CCS activities now described in Module 2 of the CSLF Technology Roadmap will be moved from the Roadmap to the "CSLF Members" section of the CSLF website and will be updated annually.
- Future major revisions to the CSLF Technology Roadmap will be done on a three-year cycle, with the next major revision scheduled for 2013.
- Future CSLF Technical Workshops are an essential CSLF activity with a desired frequency of at least one per year; the PIRT and Technical Group should be opportunistic concerning the scheduling, location, and subjects of interest for these Workshops.

Summary of Action Items

Item	Lead	Action
1	Chairman and the Four Working Group Leaders of the Task Force to Assess Progress on Technical Issues Affecting CCS	Develop the parallel Gaps Checklists concept and provide a recommendation to the PIRT on how to proceed in this area.
2	Secretariat	Circulate a listing of twelve Actions in the Technical Group Action Plan to Technical Group delegates with the request that each CSLF Member rank them by priority of importance. Compile the responses in a centralized manner and provide the resulting ranking to the Technical Group Chairman for future action. (*To be completed by the end of 2011*.)
3	Secretariat	Solicit ideas for additional Action Plan items from Technical Group delegates.
4	Secretariat	Remove country-specific CCS activities from future versions of the CSLF Technology Roadmap and instead migrate these activities to the "CSLF Members" section of the CSLF website where they will be updated annually.