Carbon Sequestration leadership forum

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MEETING SUMMARY

Projects Interaction and Review Team (PIRT) Meeting
Warrnambool, Victoria, Australia
16 October 2018

Prepared by the CSLF Secretariat

LIST OF ATTENDEES

PIRT Active Members

Australia:	Andrew Barrett (*Chair*), Max Watson
Canada:	Mike Monea
France:	Didier Bonijoly
Japan:	Ryozo Tanaka, Jiro Tanaka
Norway:	Lars Ingolf Eide, Åse Slagtern (*Technical Group Chair*), Espen Bernhard Kjærgård
Saudi Arabia:	Pieter Smeets
United Kingdom:	Brian Allison
United States:	Mark Ackiewicz, Sallie Greenberg

Allied Organizations

IEAGHG:	Tim Dixon

CSLF Secretariat Richard Lynch

Invited Speaker

Max Watson, Business Strategy Manager, CO2CRC, Australia

Observers

Australia:	Chamaka de Silva (*Department of Industry, Innovation and Science*)
	Fiona Koelmeyer (*CO2CRC*)
	Kingsley Omosigho (*Department of Industry, Innovation and Science*)
	Abdul Qader (*CO2CRC*)
Norway:	Eva Halland (*Norwegian Petroleum Directorate*)
	Stig Svenningsen (*Ministry of Petroleum and Energy*) *
United States:	Jarad Daniels (*Department of Energy*) *
	Katherine Romanak (*University of Texas*)
	Adam Wong (*Department of Energy*)

* Policy Group delegate

NOTE: The PIRT is a standing committee of the CSLF Technical Group and, as such, is not comprised of full Technical Group membership. This PIRT meeting was held in Warrnambool because of a site visit to the nearby CO2CRC Otway Research Facility, which occurred immediately following the meeting.

1. Welcome

Outgoing PIRT Chairman Andrew Barrett welcomed participants to the 29th meeting of the PIRT by acknowledging and paying respect to the traditional custodians of the land and to their Elders; past, present and future. Mr. Barrett also thanked the meeting organizers from CO2CRC and the Department of Industry, Innovation and Science, and stated that there would not be any new project up for CSLF recognition during this meeting; the two major items on the meeting agenda were an update from the CSLF-recognized CO2CRC Otway Project and a presentation from the Technical Group's ad hoc committee for task force maximization and knowledge sharing.

2. Introduction of Meeting Attendees

PIRT meeting attendees introduced themselves. In all, eight CSLF delegations were represented at the meeting.

3. Adoption of Agenda

The draft agenda for the meeting, which had been prepared by the CSLF Secretariat, was adopted without change.

4. Approval of Meeting Summary from Venice PIRT Meeting

The Meeting Summary from the April 2018 PIRT meeting in Venice was approved as final with no changes.

5. Report from CSLF Secretariat

Richard Lynch provided a two-part report from the Secretariat, which covered the status of CSLF-recognized projects and outcomes from the previous PIRT meeting.

Concerning the portfolio of CSLF-recognized projects, Mr. Lynch stated that as of August 2018 there were 32 active projects and 22 completed projects spread out over five continents.

Mr. Lynch reported that there were two outcomes from the Venice meeting:

- The PIRT recommended approval by the Technical Group for the Enabling Onshore CO_2 Storage in Europe (ENOS) Project to be a CSLF-recognized project. The Technical Group, at its meeting in Venice, also approved the project and final approval by the Policy Group would happen at its upcoming meeting on October 18th.
- There was consensus that measuring progress on recommendations from the 2017 CSLF Technology Roadmap (TRM) is one of the PIRT's most important areas of interest.

Mr. Lynch concluded his report by stating that there were two Action Items from the previous PIRT meeting:

- The Secretariat would set up an offline discussion for PIRT delegates to develop details for moving forward on finding ways to measure progress on TRM recommendations. (*Note: This was superseded by a Technical Group outcome at its meeting the next day*.)
- The Secretariat will produce summaries of questions or comments about projects being reviewed by the PIRT for CSLF recognition. These summaries would be made available prior to the PIRT meetings where the projects are to be reviewed.

6. Report from the Ad Hoc Committee for Task Force Maximization and Knowledge Sharing

Committee Chair Sallie Greenberg made a presentation that followed up on the April 2018 Technical Group meeting. During that meeting there was consensus of a need to measure progress on technical recommendations from the 2017 TRM and also to assess the impact and usage of task force reports. Dr. Greenberg reported that, following the Venice meeting, a small ad hoc group came together for this purpose and during the middle of 2018 conducted a survey to gather details on how TRM and task force reports were being used. In all there were 21 respondents representing ten CSLF member countries; thirteen of the responses were from delegates, 4 from observers, and 4 from people who did not identify their specific roles. Additionally, 12 of the respondents had participated in Clean Energy Ministerial (CEM) activities, 14 in Mission Innovation activities, and 7 in Europe's Accelerating CCS Technologies (ACT) initiative.

Concerning TRM usage, Dr. Greenberg reported that the majority of respondents have used it in formation of national RD&D CCS strategies. Examples of this include planning new CCUS strategies in China, setting a global context for Norway's national discussions about policy and RD&D priorities for CCS, informing the CCS development direction in Canada, and playing a role in a forthcoming National Petroleum Council report and recommendations to the United States Department of Energy. However, Dr. Greenberg also reported one respondent to the survey wrote that, despite the usefulness of the TRM, the document was little-known outside the CSLF and its member countries.

There was also useful information from the survey about usage of task force reports. The most widely-used reports are those which focus on CO_2 capture technologies, hydrogen with CCS, offshore CO_2 storage, and CO_2 utilization through enhanced oil recovery (EOR). These reports have been most often used for knowledge and technical gain, RD&D program planning, and (by the ISO TC265 committee) in developing standards. Additional usages have been for technology assessment, strategic planning, and proposal development. Dr. Greenberg stated that more than half of the respondents revealed that task force reports have been utilized in decision making, policy making, or knowledge sharing forums. As for being referenced in non-CSLF reports, the most frequently cited task force reports focus on offshore CO_2-EOR, CO_2 capture, and offshore CO_2 storage. And as for overall perceived usefulness, the task force reports most often recommended to others were Practical Regulations and Permitting Process, Hydrogen Production and CCS, Offshore CO_2-EOR, and Bioenergy CCS.

Dr. Greenberg also provided additional data resulting from the survey:

- All but one of the respondents had viewed and/or downloaded the TRM.
- Five of the respondents reported at least one CCS infrastructure project, with seven reporting 2-4 CCS infrastructure projects.
- Approximately half of the respondents indicated that incentives have been used to implement CCS since January 2018, and approximately half of the respondents indicated that incentives for knowledge sharing from large-scale projects had occurred. Additionally, the majority of respondents (10 of 16 respondent countries) indicated that incentives are being used for CO_2 utilization technologies.
- Concerning RD&D budgets, there has been an increase for 2 of 16 countries covered by the survey, there has been a decrease for 4 of the 16 countries, and no significant increase or decrease for the other 10 countries.

In concluding, Dr. Greenberg provided some suggestions for future Technical Group activities, based in part on information gleaned from the survey. It identified that there was an obvious need to track TRM technology recommendations, which will be an ongoing priority of the ad hoc committee, but beyond that the survey indicated there appear to be several areas where activities are warranted. These include:

- Hub/infrastructure;
- Support of developing countries (*note: this was approved by the CSLF's Capacity Building Task Force in its meeting the next day*);
- Cost-effective capture technologies;
- More clarity on economic benefits of low-carbon policy; and
- Providing technical inputs into any business model and socio-economic benefits discussions.

Dr. Greenberg provided that a future workshop on hub/infrastructure would be an especially worthwhile activity, especially if it resulted in a report as a deliverable. Also, better knowledge sharing of all Technical Group results is imperative, and the Technical Group should find better methods for wider distribution of its reports, especially the TRM.

In the ensuing discussion, Lars Ingolf Eide agreed that technical workshops are an important part of Technical Group activities, and stated that discussions are already underway with the IEAGHG about co-hosting a future workshop themed on hydrogen production with CCS. Such a workshop would result in an IEAGHG report. Mark Ackiewicz seconded the need for better ways of distributing Technical Group reports and other results. There was general agreement on this and consensus that (a) the Secretariat, on behalf of the PIRT, should write and send out brief informational emails concerning new Technical Group reports and other important results to the overall CSLF mailing list and that (b) the Technical Group's allied organizations should then also provide this information to the people on their own mailing lists. Jarad Daniels stated that the CSLF Policy Group would also take any key recommendations from the TRM and Technical Group task forces and convey this information to CSLF Ministers.

Concerning the future of the ad hoc committee, there was agreement that it should continue to obtain baseline data such as that presented by Dr. Greenberg while determining ways to track TRM recommendations and, in general, improve knowledge sharing. Several delegates recommended that the ad hoc committee continue its activities for at least another year, though that directive would have to come from the Technical Group as a whole.

Finally, concerning the TRM, there was discussion on what would be the proper timing for the next revision of the document. Mr. Eide suggested that the TRM is useful enough that it should be updated on a regular basis, perhaps on a 4-year cycle. Further discussion was tabled pending the next day's full Technical Group meeting.

7. Update on CSLF-Recognized Project: CO2CRC Otway Project

Max Watson, representing project sponsor CO2CRC, provided a progress report on the status and activities of the CO2CRC Otway Research Facility. Dr. Watson stated that the facility is one of the most comprehensive CO_2 storage demonstration laboratories in the world, and is verifying the fundamental science of CO_2 storage in Australia while further validating injection, storage and monitoring technologies globally. The facility features a state-of-the-art seismic monitoring array for observing and benchmarking

subsurface technologies and processes, and has produced and made available high quality, comprehensive datasets from its previous operations.

Dr. Watson reported that the Otway Project, to date, has consisted of three stages. An initial stage, from 2004 to 2009, demonstrated safe transport, injection and storage of CO_2 into a depleted gas reservoir. The second stage, which started in 2009 and will conclude in 2019, has demonstrated safe injection of CO_2 into a saline formation and is performing well and reservoir characterization while also testing advanced monitoring and verification of storage technologies and investigating methods for CO_2 plume stabilization. The third stage, which began in 2015 and will conclude in 2022, is demonstrating safe, reliable and cost-effective technologies for subsurface monitoring of stored CO_2. Additional stages of the project are anticipated, one of which will improve the capability to predict the role of geologic faults in controlling CO_2 fluid flow in the near surface while improving near surface monitoring capabilities.

For the third stage of the project, Dr. Watson stated that there are four main types of activities that are in progress: developing high-resolution real-time monitoring capabilities for identifying and tracking CO_2 subsurface plume movement; employing non-invasive monitoring techniques which will be acceptable for community and regulators; evolving these technologies from benchtop application to in-field validation that is aligned with operator need; and providing a suite of technologies and workflows that can be selected to create solutions which optimize effectiveness and costs in commercial monitoring projects. Dr. Watson closed his presentation by describing some of the accomplishments of the Otway Research Facility. These include demonstrating real world CCS for both the local community and the community at large, providing an opportunity to overcome real-world engineering challenges under operational conditions, enabling a decrease in technical risk and uncertainty while testing technical performance prior to embarking on large-scale projects, and providing an impetus to regulators to confront some of the regulatory issues when there is a real project.

8. General Discussion and New Business

Katherine Romanak noted that her organization, the University of Texas's Bureau of Economic Geology, has hosted several CSLF-branded technical workshops in the past few years. For these, CSLF capacity building funds had been used to bring in representatives from CSLF members that are developing countries. However, the CSLF capacity building funds do not allow funding travel for representatives from non-member countries. For the first workshop, the United Nations Climate Technology Center and Network (CTCN) provided travel funds for representatives from non-CSLF countries but this was unfortunately not provided for subsequent workshops. Jarad Daniels responded that use of capacity building funds for this purpose is being revisited by the CSLF Capacity Building Governing Council, which was scheduled to meet on October 16th following the Technical Group meeting. Dr. Romanak also noted that the CSLF is a fabulous platform for engaging developing countries and that she would be mentioning that during her presentation at the following week's GHGT14 conference.

9. Adjourn

Chairman Andrew Barrett once again thanked the meeting organizers from CO2CRC and the Department of Industry, Innovation and Science for organizing the field trip and arranging for the site of the PIRT meeting. Prior to adjourning the meeting, Mr. Barrett stated that this would be his final meeting due to impending retirement and thanked the CSLF for the opportunity to be PIRT Chair over the past three years.

Summary of Meeting Actions and Outcomes

- The CSLF Secretariat, on behalf of the PIRT, will write and send out brief informational emails concerning new Technical Group reports and other important results to the overall CSLF mailing list. Allied organizations should then also provide this information to the people on their own mailing lists.
- The ad hoc committee for task force maximization and knowledge sharing was advised to continue with no firm end date. The Technical Group will provide specific direction and purpose.