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MEETING SUMMARY

Projects Interaction and Review Team (PIRT) Meeting
Washington, D.C., USA
04 November 2013

Prepared by the CSLF Secretariat

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LIST OF ATTENDEES

Chair Clinton Foster (Australia)

CSLF Delegates

Australia:	Richard Aldous
Canada:	Eddy Chui
China:	Jiutian Zhang
European Commission:	Jeroen Schuppers
France:	Didier Bonijoly
Italy:	Giuseppe Girardi
Japan:	Ryozo Tanaka
Korea:	Chong Kul Ryu, Chang Keun Yi
Netherlands:	Paul Ramsak
Norway:	Trygve Riis, Lars Ingolf Eide
Saudi Arabia:	Ali Al-Meshari
South Africa:	Tony Surridge
United Kingdom:	Philip Sharman
United States:	Mark Ackiewicz, George Guthrie

CSLF Secretariat John Panek, Richard Lynch, Steve Geiger

Project Sponsors

Kemper County Energy Facility
Kerry Bowers, The Southern Company, United States

SECARB Phase III Anthropogenic Test and Plant Barry Project
Jerry Hill, Southern States Energy Board, United States

MRCSP Development Phase Project
Neeraj Gupta, Battelle Memorial Institute, United States

Observers

France:	Bernard Frois
Norway:	Bjørn-Erik Haugan, Vegar Stokset
United Kingdom:	Mark Crombie, Luke Warren
United States:	Chris Babel, Arthur Lee, Andy Paterson, Kimberly Sams, Robert Van Voorhees, James Wood
IEA GHG:	Tim Dixon

1. **Welcome and Summary of Previous PIRT Meeting**

PIRT Chairman Clinton Foster of Australia welcomed participants to the 20th meeting of the PIRT and provided a brief summary of the April 2013 PIRT meeting in Rome, Italy. At that meeting the PIRT reached consensus on the following:

Clinton Foster and John Panek

- Recommended that the Uthmaniyah CO_2-EOR Project and the Alberta Carbon Trunk Line Project be approved by the Technical Group and be presented for CSLF recognition at the next Policy Group meeting.
- Deferred consideration of the UNIS CO_2 Lab Project until the next PIRT meeting.
- Continued the use of the current CSLF Project Submission Form pending agreement on a complete revision to the Form.
- Assumed responsibility for all activities related to the Technical Group Action Plan's "Best Practices Knowledge Sharing" action.
- Deferred consideration of the Knowledge Hub proposal until the next PIRT meeting.

The Technical Group subsequently accepted these recommendations at its meeting in Rome.

2. **Adoption of Meeting Agenda**

The meeting Agenda was adopted with no changes.

3. **Introduction of Meeting Attendees**

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

4. **Approval of Meeting Summary from Perth PIRT Meeting**

The Meeting Summary from the April 2013 PIRT meeting in Rome was approved as final with no changes.

5. **Report from CSLF Secretariat**

John Panek gave a presentation that briefly reported on the outcomes of the April 2013 Technical Group meeting in Rome, including the two projects that were recommended by the Technical Group for CSLF recognition. A CO_2 Monitoring Interactive Workshop was held as part of the Rome meeting; presentations and conclusions from the workshop are now online at the CSLF website (there is a link at the "Meetings / Workshops" page). Mr. Panek also mentioned that updates and photos from several of the CSLF-recognized projects were incorporated into a special booklet that can be downloaded from the Washington meeting page of the CSLF website.

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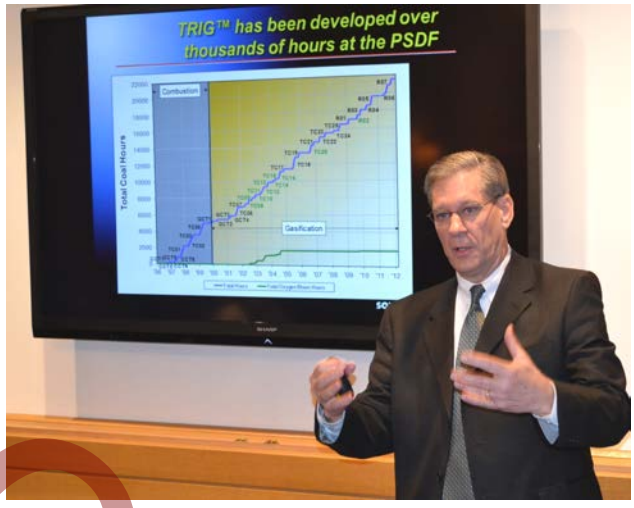
6. Review and Approval of Projects Nominated for CSLF Recognition

The following three projects had been nominated for CSLF recognition:

- Kemper County Energy Facility (nominated by the United States and Canada)
- Southeast Regional Carbon Sequestration Partnership (SECARB) Phase III Anthropogenic Test and Plant Barry Carbon Dioxide (CO2) Capture and Storage (CCS) Project (nominated by the United States, Japan, and Canada)
- Midwest Regional Carbon Sequestration Partnership (MRCSP) Development Phase Project (nominated by the United States and Canada)

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

Kemper County Energy Facility



Kerry Bowers

Kerry Bowers, President and CEO of Southern Generation Technologies, gave a presentation about the Kemper project. This commercial-scale CCS project, located in east-central Mississippi in the United States, will capture approximately 3 million tonnes of CO_2 per year from an integrated gasification combined cycle (IGCC) power plant, and will include pipeline transportation of approximately 60 miles to an oil field where the CO_2 will be sold for enhanced oil recovery (EOR). The commercial objectives of the project are large-scale demonstration of a next-generation gasifier technology for power production and utilization of a plentiful nearby lignite coal reserve. Approximately 65% of the CO_2 produced by the plant will be captured and utilized. Construction of the project, including the pipeline, is complete and commercial operation will begin in 2014.

After brief discussion, there was consensus by the PIRT to recommend approval of the Kemper County Energy Facility by the Technical Group.

Southeast Regional Carbon Sequestration Partnership (SECARB) Phase III Anthropogenic Test and Plant Barry CCS Project

Jerry Hill

Jerry Hill, Senior Technical Advisor at the Southern States Energy Board, gave a presentation about the SECARB project. This large-scale fully-integrated CCS project, located in southeastern Alabama in the United States, brings together components of CO_2 capture, transport, and geologic storage, including monitoring, verification, and accounting of the stored CO_2. A flue gas slipstream from a power plant

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equivalent to approximately 25 megawatts of power production is being diverted to allow large-scale demonstration of a new amine-based process that can capture approximately 550 tons of CO_2 per day. A new 19 kilometer pipeline has also been constructed, as part of the project, for transport of the CO_2 to a deep saline storage site. Objectives of the project are to gain knowledge and experience in operation of a fully integrated CCS large-scale process, to conduct reservoir modeling and test CO_2 storage mechanisms for the types of geologic storage formations that exist along the Gulf Coast of the United States, and to test experimental CO_2 monitoring technologies.

After brief discussion, there was consensus by the PIRT to recommend approval of the SECARB Phase III Anthropogenic Test and Plant Barry CCS Project by the Technical Group.

Midwest Regional Carbon Sequestration Partnership (MRCSP) Development Phase Project

Neeraj Gupta, Senior Research Leader at Battelle, gave a presentation about the MRCSP project. This is a large-scale CO_2 storage project, located in Michigan and nearby states in the northern United States that will, over its four-year duration, inject a total of one million tonnes of CO_2 into different types of oil and gas fields in various lifecycle stages. The project will include collection of fluid chemistry data to better understand geochemical interactions, development of conceptual geologic models for this type of CO_2 storage, and a detailed accounting of the CO_2 injected and recycled. Project objectives are to assess storage capacities of these oil and gas fields, validate static and numerical models, identify cost-effective monitoring techniques, and develop system-wide information for further understanding of similar geologic formations. Site characterizations are now underway, with long-term CO_2 injection and monitoring to begin in 2015. A final topical report is expected in 2019. Results obtained during this project are expected to provide a foundation for validating that CCS technologies can be commercially deployed in the northern United States.

Neeraj Gupta

After brief discussion, there was consensus by the PIRT to recommend approval of the MRCSP Development Phase Project by the Technical Group.

Following review and approval of these three projects, there was brief discussion about the UNIS CO_2 Lab Project, whose approval had been deferred at the April 2013 PIRT meeting in Rome. The project was not approved in Rome because of uncertainty about project funding and also the future of the existing coal-fueled power station in Svalbard, Norway, where the project would be sited. Trygve Riis reported that the future of the power plant is still not clear, and because of this the project has not moved forward. The project sponsor might re-submit the project for consideration at a future PIRT meeting.

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7. Review of PIRT Governance

Dr. Foster provided background concerning current PIRT governance issues. The current PIRT Terms of Reference document (ToR) was ratified at the February 2010 PIRT meeting in Canberra, Australia. However, PIRT functions and procedures have evolved considerably since then, and the 2010 ToR has been perceived to be in need of update. There was considerable discussion involving specific edits and additions to the document, and the CSLF Secretariat was asked to prepare a new version that incorporates all the edits. (*Note: the updated ToR is appended to this Meeting Summary*.)

8. Update of CSLF Project Submission Form

Dr. Foster stated that the previous PIRT meeting had made progress on updating the CSLF Project Submission Form, but that the current version of the Project Submission Form would continue to be used pending agreement on a complete revision of the Form. Once again, there was considerable discussion involving specific edits to the document, and in the end there was agreement to eliminate the existing "Project Elements" section, eliminate the "Relevance to CSLF Gaps Analysis" section, and eliminate the three questions under the "Information Availability" section. The CSLF Secretariat was asked to prepare a new version that incorporates all the edits. (*Note: the updated Project Submission Form is appended to this Meeting Summary*.)

9. Discussion of Knowledge-Sharing from CSLF-Recognized Projects

Dr. Foster stated that at the April 2013 Technical Group Meeting in Rome, the PIRT was given the responsibility for the "Best Practices Knowledge Sharing" action of the Technical Group's Action Plan. However, because the Global Carbon Capture and Storage Institute (GCCSI) is already active in this area, there was agreement that any activities in this area would be deferred until more was known about the CGGSI's intentions. Dr. Foster noted that the GCCSI has proposed the creation of a new "Knowledge Hub" website that could be "co-branded" with the CSLF and would serve as a gateway to a broad range of information on CCS technologies and projects. This would include connections to other knowledge-sharing sites such as the European CCS Demonstration Project Network. After ensuing discussion, it was decided there was insufficient information as yet to move this forward. For example, Philip Sharman pointed out that the definition of what constitutes a project appears to be different for the CSLF and the GCCSI. Dr. Foster agreed that there would need to be clarification before the PIRT could engage the GCCSI. There was no representative of the GCCSI present, so Dr. Foster stated that he will obtain further information for the PIRT on how the co-branded website would work and on any other GCCSI knowledge-sharing activities that are relevant to the PIRT.

Concerning the CSLF-recognized projects, Mr. Panek stated that the CSLF Secretariat had requested updates from the projects and had developed a booklet for the current meeting from the information received. Projects will be also asked for updates for the next CSLF Annual Meeting, and PIRT delegates may be asked to help facilitate these requests for projects located in their countries.

10. Adjourn

Dr. Foster thanked the attendees for their participation and adjourned the meeting.

Observer

Summary of Consensus Reached

- The PIRT recommends approval by the Technical Group for the Kemper County Energy Facility, the SECARB Phase III Anthropogenic Test and Plant Barry CCS Project, and the MRCSP Development Phase Project.
- The PIRT agrees to an update to the PIRT Terms of Reference and an update to the CSLF Project Submission Form.

Action Items

- The CSLF Secretariat will prepare newly updated versions of the PIRT Terms of Reference and the CSLF Project Submission Form, incorporating edits approved during the PIRT meeting. (*Note: the updated documents are appended below*.)
- The PIRT Chair will obtain further information from the GCCSI about its proposal for a co-branded CSLF-GCCSI Knowledge Hub website and other GCCSI knowledge sharing activities relevant to the PIRT.

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Revised: November 2013

Terms of Reference

CSLF Projects Interaction and Review Team

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Background

One of the main instruments to help the CSLF achieve its goals is through the recognition of CSLF projects. Learnings from CSLF projects are key elements to knowledge sharing which will ultimately assist in the acceleration of the deployment of carbon capture and storage (CCS) technologies. It is therefore of major importance to have appropriate mechanisms within the CSLF for the recognition, assessment and dissemination of projects and their results for the benefit of the CSLF and its Members. To meet this need the CSLF has created an advisory body, the PIRT, which reports to the CSLF Technical Group.

PIRT Functions

The PIRT has the following functions:

- Assess projects proposed for recognition by the CSLF in accordance to the project selection criteria developed by the PIRT. Based on this assessment make recommendations to the Technical Group on whether a project should be accepted for recognition by the CSLF.
- Review the CSLF project portfolio and identify synergies, complementarities and gaps, providing feedback to the Technical Group.
- Provide input for further revisions of the CSLF Technology Roadmap (TRM) and respond to the recommended priority actions identified in the TRM.
- Identify where it would be appropriate to have CSLF recognized projects.
- Foster enhanced international collaboration for CSLF projects.
- Ensure a framework for periodically reporting to the Technical Group on the progress within CSLF projects.
- Organize periodic events to facilitate the exchange of experience and views on issues of common interest among CSLF projects and provide feedback to the CSLF.
- Manage technical knowledge sharing activities with other organizations and with CSLF-recognized projects.
- Perform other tasks which may be assigned to it by the CSLF Technical Group.

Membership of the PIRT

The PIRT consists of:

- A core group of Active Members comprising Delegates to the Technical Group, or as nominated by a CSLF Member country. Active Members will be required to participate in the operation of the PIRT.

- An *ad-hoc* group of Stakeholders comprising representatives from CSLF recognized projects. (*note: per Section 3.2 (e) of the CSLF Terms of Reference and Procedures, the Technical Group may designate resource persons*)

The PIRT chair will rotate on an *ad hoc* basis and be approved by the Technical Group.

Projects for CSLF Recognition

- CCS projects seeking CSLF recognition will be considered on their technical merit.
- Projects for consideration must contribute to the overall CSLF goal to "accelerate the research, development, demonstration, and commercial deployment of improved cost-effective technologies for the separation and capture of carbon dioxide for its transport and long-term safe storage or utilization".
    - There is no restriction on project type to be recognized as long as the project meets the criteria listed below.
    - Learnings from similar projects through time will demonstrate progress in CCS.
- Proposals will meet at least one of the following criteria.
    - An integrated CCS project with a capture, storage, and verification component and a transport mechanism for CO_2.
    - Demonstration at pilot- or commercial-scale of new or new applications of technologies in at least one part of the CCUS chain.
    - Demonstration of safe geological storage of CO_2 at pilot- or commercial-scale.

Operation and Procedures of the PIRT

- The PIRT will establish its operational procedures. The PIRT will coordinate with the Technical Group on the agenda and timing of its meetings.
- The PIRT should meet as necessary, often before Technical Group meetings, and use electronic communications wherever possible.
- The TRM will provide guidance for the continuing work program of the PIRT.

Project Recognition

- Project proposals should be circulated to Active Members by the CSLF Secretariat.
- No later than ten days prior to PIRT meetings, Members are asked to submit a free-text comment, either supporting or identifying issues for discussion on each project nominated for CSLF recognition.
- At PIRT meetings or via proxy through the PIRT Chair, individual country representatives will be required to comment on projects nominated for CSLF recognition.
- Recommendations of the PIRT should be reached by consensus with one vote per member country only.

Information Update and Workshops

- Project updates will be requested by the Secretariat annually; the PIRT will assist in ensuring information is sent to the Secretariat.
- The PIRT will facilitate workshops based on technical themes as required.
- As required, the PIRT will draw on external relevant CCS expertise.

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CSLF PROJECT SUBMISSION FORM

PROJECT TITLE:

PROJECT LOCATION:
Please provide the city (or nearest town), the state/province/region, and the country.

PROJECT GOAL:
Please provide a simple and to-the-point explanation in one or two sentences that can be easily understood by someone with no prior knowledge of the project.

PROJECT OBJECTIVES AND ANTICIPATED OUTCOMES:
Please provide a breakdown of the Project Goal into the constituent steps comprising the whole. Use bullet points to separate the steps and indicate key anticipated outcomes. Indicate what the project does to facilitate CCS deployment.

PROJECT DESCRIPTION AND RELEVANCE (non-technical):
Please provide a concise synopsis of the project (who, what, why, where and how) with easily understandable descriptions of the associated science, technology, and goals. This should include an indication of areas of industrial application and relevance. Target audience: policy makers, press, non-scientific community.

PROJECT DESCRIPTION (technical):
Please provide a more detailed technical description of the project with all significant information. Target audience: engineers and scientists.

PROJECT TIMELINE:
Please provide the project start date, any milestone events (listed chronologically), and the end date. Use most realistic timeline available. Use official (contract signing, etc.) start date. End date should reflect contractual timeline if possible. Use bullet points.

Please also provide answers to the following questions:

Has the project already progressed through the early phases of planning, such as (but not exclusively) documenting the project scope, outputs and outcomes? _____

Has the project management identified the magnitude of resource requirements sufficient to achieve the major milestones of the project? _____

Has the project management identified funding sources for the project? _____

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INFORMATION AVAILABILITY:

Please provide a description of the types of information that will be made available from the project and the outcomes that would be achieved by the project. (Note: It is anticipated that an update on the project will be requested annually by the CSLF. Information provided by the project will be made available at the CSLF website.)

PROJECT CONTACTS:

Please provide name and contact information (including telephone and e-mail) for the project manager or coordinator. If relevant, please also provide name and contact information (including telephone and e-mail) for the person who will handle any requests for site visits.

Please also provide an answer to the following question:

What restrictions, issues, or costs will be assumed by any visitors to the project site?

OTHER PROJECT PARTICIPANTS:

Please provide a listing of all entities who are participating in this project. If available, please also include a management structure diagram or otherwise indicate the role of each participating entity.

PROJECT WEBSITES:

Please provide the web address of the main project website, if one exists. If available, please also provide the web addresses of other project-related websites such as workshops, project presentations, etc.

PROJECT NOMINATORS:

In order to formalize and document the relationship with the CSLF, the project representative and at least two CSLF Members nominating the project must sign the Project Submission Form specifying that relationship before the project can be considered. Alternatively, project representatives and nominators can email the CSLF Secretariat (cslfsecretariat@hq.doe.gov) as an alternative to signatures on the Form..

_____

Project Representative
(Affiliation)

_____

CSLF Delegate
(CSLF Member)

_____

CSLF Delegate
(CSLF Member)

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CSLF Project Elements Checklist

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(Please check all of the following areas that your project will address.)

GENERAL

Project Scale	
Feasibility	
R&D	
Pilot	
Demonstration	
Commercial	

CAPTURE TECHNOLOGIES

Capture Type	
Pre-combustion capture	
Post-combustion capture	
Oxyfuel combustion	
Industrial applications	
Technology	
Advance the capture technology	
Advance plant design for capture efficiency (e.g., boiler, turbine design)	
Improved fuel handling and air separation processes technology	
Improved combustion and flue gas science	
Advance purification and compression technology	
Polygeneration optimization	

TRANSPORT

General	
Tanker Transport	
Pipeline Transport	
Ship transport	
Specifications for impurities from various processes	
Regulations, standards and safety protocols, including response and remediation	

STORAGE AND MONITORING

Storage Complex Type	
Saline formations	
Unconventional reservoirs (e.g basalt, shale)	
Unmineable coal formations	
EOR and/or EGR	
Depleted oil and gas fields	
Storage complex characterization	
CO_2-water-rock (or coal) interactions	
Impact of the quality of CO_2 on storage	
Improved modeling of complex	
Effects of CO_2 rock/water interactions and induced changes in temperature, pressure and stress on permeability, injectivity, migration, trapping and capacity.	
Pressure management (e.g., production of formation water)	
Monitoring the storage complex including risk assessment	
Development of new or improved CO_2 monitoring technologies	
Improve baseline monitoring and distinguish between natural and anthropogenic CO_2	
Development of risk minimization/mitigation methods and strategies, including leakage	
Improve well integrity, well abandonment practices, and/or remediation of existing wells	

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