



Minutes of the Technical Group Meeting

Perth, Australia

Thursday, 25 October 2012

LIST OF ATTENDEES

Technical Group Delegates

Australia:	Clinton Foster (Vice Chair), Richard Aldous
Canada:	Stefan Bachu, Eddy Chui
China:	Jiutian Zhang
European Commission:	Jeroen Schuppers
France:	Didier Bonijoly
Italy:	Giuseppe Girardi
Japan:	Ryozo Tanaka
Korea:	Young Cheol Park, Chong Kul Ryu
Netherlands:	Paul Ramsak
Norway:	Trygve Riis (Chair), Jostein Dahl Karlsen
Saudi Arabia:	Ahmed Aleidan
South Africa:	Tony SurrIDGE (Vice Chair)
United Kingdom:	Philip Sharman
United States:	Darren Mollot, George Guthrie

Representatives of Allied Organizations

Global CCS Institute: Peter Grubnic

CSLF Secretariat

John Panek, Richard Lynch

Invited Speakers

Wayne Calder, Department of Resources, Energy and Tourism, Australia

Dominique Van Gent, Department of Mines and Petroleum, State Government of Western Australia

Maureen Clifford, Department of Primary Industries, Energy & Earth Resources Group, State Government of Victoria, Australia

Observers

Australia:	Chris Consoli, Peter Cook, Declan Kuch, Bruce Murphy, Claire Richards
Chinese Taipei:	Chi-Wen Liao, Shoung Ouyang
Norway:	Nils A. Røkke
United States:	Arthur Lee

1. Chairman's Welcome and Opening Remarks

The Chairman of the Technical Group, Trygve Riis, called the meeting to order and welcomed the delegates and observers to Perth.

Mr. Riis provided context for the meeting by mentioning that the CSLF has been planning for the next Ministerial Meeting, which will take place in late 2013, and prior to that there would be another Technical Group meeting in the second quarter of 2013. Several items on the agenda for this meeting are relevant to these upcoming meetings. In regards to next year's Ministerial Meeting, the Policy Group has requested that the Technical Group consider how the CSLF can become more relevant – how it can increase its visibility and have greater influence on the Ministers who will be attending the meeting.

Mr. Riis concluded his remarks by mentioning that the current meeting would include a presentation on Australia's carbon capture and storage (CCS) projects, two presentations from sponsors of projects that have been proposed for CSLF recognition, an update on the 2013 CSLF Technology Roadmap, and progress reports from the Technical Group's Task Forces.

2. Host Country Presentation

Clinton Foster, Chief Scientist for Geoscience Australia, welcomed the Technical Group to Perth and provided a brief overview of the Australia's CCS policy drivers and projects. At July 2012, the price for CO₂ was set at A\$23 per tonne. After three years there will be a transition to a flexible price that the market will determine through a cap-and-trade system. This price for CO₂ is not expected to be high enough to commercialize CCS in Australia, but it will be sufficient to put CCS on the agenda at the corporate level. Placing a price on carbon emissions will provide a commercial incentive for emissions-intensive industries to utilize CCS to reduce their carbon price liability.

Dr. Foster stated that CCS is a very important component of Australia's strategy for addressing climate change. Currently, Australia is heavily reliant on fossil fuels for domestic energy demand, with several high-emitting industries that could be made much less so if retrofitted with CCS technology. There are several large projects that are underway or in planning, including the South West Hub Geosequestration Project in southwestern Australia, the CarbonNet Project in southeastern Australia, and the Gorgon CO₂ Injection Project in northwestern Australia. Each of these will store millions of tonnes of CO₂ annually. South West Hub and CarbonNet have been designated as Flagship Projects by the Australian Government and have been proposed for CSLF recognition, while Gorgon is already a CSLF-recognized project.

Dr. Foster closed his remarks by conveying the following message from Australia's Minister of Resources and Energy, The Honourable Martin Ferguson AM MP: "I wish you a successful meeting, and encourage you to exchange ideas and discuss practical ways to accelerate the development and deployment of CCS."

3. Introduction of Delegates and Observers

Technical Group delegates and observers present for the session introduced themselves. Fourteen of the twenty-five CSLF Members were present at this meeting, including representatives from Australia, Canada, China, the European Commission, France, Italy, Japan, Korea, the Netherlands, Norway, Saudi Arabia, South Africa, the United Kingdom, and the United States. Observers representing Australia, Chinese Taipei, Norway, and the United States were also present.

4. Adoption of Agenda

The Agenda was adopted with the small change that the report from the CO₂ Technology Opportunities and Gaps Task Force would be heard immediately after the discussion on the 2013 Technology Roadmap.

5. Approval of Minutes from Bergen Meeting

The Technical Group minutes from the June 2012 meeting in Bergen, Norway, were approved as final with no changes.

6. Review of Action Items from Bergen Meeting

John Panek provided a brief update on the twelve action items from the Bergen meeting. Exploration is still underway on whether the Phase II Report from the now discontinued Risk Assessment Task Force will be published as a journal article. The option of forming a new Best Practices Knowledge Sharing Task Force was up for discussion later in the meeting as part of the update on the Technical Group Action Plan. Mr. Panek stated that the remaining ten action items have all been completed.

7. Report from CSLF Secretariat

John Panek gave a brief presentation that summarized CSLF activities that had occurred since the June Technical Group meeting in Bergen, including the July 2012 Risk and Liability Workshop in Paris and Capacity Building activities in Brazil in late July and early August. The capacity building event was the first of four planned courses in Brazil to focus on carbon capture, utilization and storage (CCUS) and featured five days of presentations and discussions from global experts.

The Risk and Liability Workshop was a two-day event and included sessions on how geologic risks are measured by geologists and geological engineers; how business risks and potential liabilities are evaluated for business decisions; how risks are valued and how the insurance industry and banking sectors address liabilities; issues encountered by governments in addressing liability and their approaches to risk and liability; what will make the public be and feel safe and comfortable with CCUS; and what will make investors comfortable.

Mr. Panek also gave a short update on the CSLF-recognized projects. As of the beginning of October there are 23 active and 11 completed projects in the portfolio. The most recent project to be completed is the Demonstration of an Oxyfuel Combustion Project, located in the United Kingdom. Mr. Panek stated that the Secretariat has redesigned the 'Projects' page of the CSLF website to include a map of the locations of all the active and completed projects.

8. CCS in Australia

Wayne Calder, General Manager of the Low Emissions Coal and CO₂ Storage Branch of Australia's Department of Resources, Energy and Tourism, gave a presentation that described Australia's priorities and policy framework for CCS, and some of the projects that are now underway. Currently, Australia's electricity generation is predominately driven by fossil fuels, with about 90% of its electricity generated from coal and natural gas. Australia is also very committed to address climate change, and has set CO₂ emissions reduction goals of 5% by 2020 and 80% by 2050 (based on year 2000

emissions). To get there, substantial investment in low emissions technologies, including CCS, will be needed.

Mr. Calder described some of the actions taken by the Australian government to address the dual challenge of meeting these ambitious CO₂ reduction goals while maintaining a strong economy that is heavily dependent on fossil fuels. Development of renewable energy is being accelerated and a new Clean Energy Finance Corporation has been created and allocated with A\$10 billion in funding, which will be leveraged with private sector investments for large-scale clean energy technology projects. Australian government funding for CCS includes the CCS Flagships Program (A\$1.7 billion funding), the National Low Emissions Coal Initiative (A\$370 million funding), the National CO₂ Infrastructure Plan (A\$61 million funding), and the Global CCS Institute (A\$315 million funding).

Mr. Calder stated that the carbon price that was instituted earlier in 2012 is just one policy-driven step toward widespread implementation of CCS. The policy framework for CCS in Australia includes legislative certainty, storage issues, research and development, project demonstration and financing (from pilot scale to large-scale demonstrations), stakeholder engagement, and knowledge sharing. Community acceptance is also paramount to success, and involves two different aspects: assurance of safety and resolving land use issues associated with CCS, and achieving a broadly-based community attitude that CCS is a necessary technology for addressing climate change. A “CCS Communication and Awareness Strategy” has been implemented that incorporates these outreach perspectives.

Mr. Calder ended his presentation by briefly describing some of the individual project activities that are ongoing in Australia, including the previously-mentioned Gorgon, South West Hub, and CarbonNet projects. In addition, the pilot-scale Callide Oxyfuel Project in Queensland State will capture and store CO₂ from a 30 megawatt unit at Callide Power Station that has been retrofitted with oxycombustion technology. A revised Queensland Flagship CCS project is also under development. Mr. Calder reinforced that demonstrating CCS at commercial scale is critical to future deployment, and that implementing demonstration projects requires consideration of all elements of the CCS puzzle.

9. Report from the CSLF Projects Interaction and Review Team (PIRT)

The PIRT Chair, Clinton Foster, gave a brief presentation that summarized the previous day’s PIRT meeting. There were two major outcomes from the meeting:

- There was consensus for simplification of the CSLF Gaps Analysis Checklist, reducing it in length from seven pages down to a single page.
- Two projects were approved by the PIRT for Technical Group action: the South West Hub Geosequestration Project (nominated by Australia and supported by the United States and Canada) and the CarbonNet Project (nominated by Australia and supported by the United States).

After brief discussion, the Technical Group reached consensus that it will henceforward use the PIRT’s simplified and more concise version of the Gaps Analysis Checklist.

10. Approval of Projects Nominated for CSLF Recognition

South West Hub Geosequestration Project (nominated by Australia, United States, and Canada)

Dominique Van Gent, Coordinator of Carbon Strategy for the State Government of Western Australia's Department of Mines and Petroleum, gave a presentation about the South West Hub Project. This project will implement a large-scale "CO₂ Hub" for multi-user capture, transport, utilization, and storage of CO₂ in southwestern Australia near the city of Perth. The project is one of Australia's "Flagship" projects for large-scale demonstration of CCS technologies. Several industrial and utility point sources of CO₂ will be connected via a pipeline to a site where the CO₂ can be stored deep underground in the Triassic Lesueur Sandstone Formation. The project initially plans to sequester 2.4 million tonnes of CO₂ per year and has the potential for capturing approximately 6.5 million tonnes of CO₂ per year. A separate and unique feature of the project is that an additional approximately one quarter million tonnes of CO₂ per year will be permanently chemically stored in bauxite residue as part of an environmentally beneficial amelioration program. The project will also include reservoir characterization and, once storage is underway, measurement, monitoring and verification (MMV) technologies.

After brief discussion, there was consensus by the Technical Group to recommend to the Policy Group that the South West Hub Geosequestration Project receive CSLF recognition.

CarbonNet Project (nominated by Australia and United States)

Maureen Clifford, Communications & Stakeholder Engagement Manager for the State Government of Victoria's Energy & Earth Resources Group at the Department of Primary Industries, gave a presentation about the CarbonNet Project. This project will implement a large-scale multi-user CO₂ capture, transport, and storage network in southeastern Australia in the Latrobe Valley. The project is another of Australia's "Flagship" projects for large-scale demonstration of CCS technologies. Multiple industrial and utility point sources of CO₂ will be connected via a pipeline to a site where the CO₂ can be stored in sub-seabed saline aquifers in the offshore Gippsland Basin. The project initially plans to sequester approximately 1 to 5 million tonnes of CO₂ per year, with the potential to increase capacity significantly over time. The project will also include reservoir characterization and, once storage is underway, measurement, monitoring and verification (MMV) technologies.

After brief discussion, there was consensus by the Technical Group to recommend to the Policy Group that the CarbonNet Project receive CSLF recognition.

11. Update on 2013 CSLF Technology Roadmap (TRM)

Trygve Riis provided a brief status update on the 2013 CSLF TRM. At the June 2012 Technical Group meeting in Bergen, there was consensus that the next TRM would be a deliverable at the 2013 CSLF Ministerial Meeting and that the time horizon of the TRM would run to the year 2030, with the year 2020 being an important milestone. This is to be a major TRM revision, but it will be much shorter than the current version and with emphasis on presenting clear and concise messages to Ministers and policy makers. To that end, a Steering Committee was formed, led by the Technical Group Chair and including the Technical Group Vice Chairs, Task Force Chairs, and Secretariat, and has responsibility for all aspects of the new TRM, including the scope, content, and process for completion.

Mr. Riis stated that the Steering Committee held a preliminary meeting in Bergen, followed by several teleconference meetings, and then an in-person meeting in Perth. This has resulted in a scoping document which describes the objectives and scope of the TRM as well as the process (including a proposed timeline) for completion. An initial draft of the TRM's status and assessment will be ready by mid December, and by early January there will be a first draft of the TRM's priorities for research, development and demonstration (RD&D) activities. A complete initial draft of the 2013 TRM is expected to be available for review by the Technical Group prior to its next meeting in the 2nd quarter of 2013. Mr. Riis mentioned that the Steering Committee will have a one-day meeting in conjunction with the next Technical Group meeting to review the initial draft. An advanced draft, incorporating comments from Technical Group delegates, is expected in June 2013, and this would be followed by review by both the Technical Group and Policy Group. Any comments and revisions would then be incorporated into the final version of the 2013 TRM. There was consensus to accept this schedule.

Mr. Riis mentioned that he had met with Ellina Levina of the International Energy Agency (IEA), who is working on IEA's CCS Roadmap and reached informal agreement that work on the two Roadmaps should be coordinated. There was also agreement that the two Roadmaps should convey consistent messages to policy makers, and be presented in a form that can influence priorities in some countries. The IEA has established an Advisory Board to oversee its CCS Roadmap, but the technical sections have not yet been written. Therefore, the upcoming draft of the TRM's status and assessment would be valuable to the IEA, and Ms. Levina is quite interested in getting technical input from the CSLF.

Concerning the process for completion of the TRM, Mr. Riis stated that he had contacted Norway's Ministry of Petroleum and Energy (MPE), which agreed to help support the CSLF TRM work by providing funding to hire a consultant for this work. SINTEF has been contracted for this support, and three consultants from SINTEF will work with Lars Ingolf Eide of the Research Council of Norway, who will be the editor. The TRM Steering Committee will be consulted as needed on a continuing basis.

Philip Sharman noted that there is an inherent linkage between the Technical Group's TRM activities and the new Technical Group Task Force on CO₂ Technology Opportunities and Gaps. Because of this, there was consensus for that Task Force to give its report next.

12. Report from CO₂ Technology Opportunities and Gaps Task Force

The Task Force Chair, Richard Aldous, gave a brief update on the Task Force and its activities. The Task Force would undertake a comprehensive look at the key technologies in play around CCS and CCUS with a view toward identifying scientific and technology gaps and opportunities which have the potential to significantly impact CCS and CCUS demonstration and deployment. Reports from the Task Force would provide recommendations on how the global technology development pathway could be sped up or enhanced to further drive down costs and enhance efficiency for these technologies.

Dr. Aldous stated that the Task Force would go into a somewhat deeper level of detail than the TRM, but would have the same framework as the TRM since information from the Task Force would be a TRM input. The Task Force results can be reported in spreadsheet format, perhaps using technology readiness level methodologies. Phase 1 work will review existing reports and other work that has been done in this area by outside organizations, and will decide on an assessment methodology. The interim

Phase 1 Report will include identification of high-level gaps and opportunities. Phase 2 of the Task Force's activities will include an analysis of these high level gaps and opportunities. A draft of the interim Phase 1 Report is expected in time for the next Technical Group meeting. The Task Force is currently comprised of Australia (as Chair), Korea, Norway, and the United States.

Ensuing discussion focused on the timelines for development of the TRM and of the Task Force. Stefan Bachu and Philip Sharman both observed that even though the timelines mostly were in synch, some of the results from the Task Force may still come too late to be inputs for the 2013 TRM. However, the two initiatives should still proceed in parallel, as there will be future versions of the TRM.

13. Update on Technical Group Action Plan

John Panek provided a brief summary of the Action Plan. At the September 2011 CSLF Ministerial Meeting in Beijing, the Technical Group approved a new multi-year Action Plan to identify priorities and provide a structure and framework for conducting Technical Group efforts through 2016. Twelve individual actions were identified, and Task Forces have been formed to address four of these twelve actions. Reports from these four new Task Forces are part of the Perth meeting. Mr. Panek stated that activity on another action, Competition of CCS with Other Resources, had been deferred pending the forthcoming IEA Greenhouse Gas R&D Programme (IEA GHG) study related to that topic. As for the action on the Best Practices Knowledge Sharing action, activity had also been deferred, as the Global CCS Institute has been involved in that area.

In response, Peter Grubnic stated that the Global CCS Institute's position was that its members have provided the feedback that knowledge sharing must be a key focus for the Institute and that the Institute should, as much as possible, make its knowledge systems available to other organizations. Mr. Grubnic mentioned that the Institute welcomes the opportunity to work with other organizations, and is already involved with the European Commission's demonstration projects network as well as its Japanese and Korean members, for dissemination of CCS-related learnings. This kind of collaboration reduces duplication, stretches resources, and increases efficiency.

Trygve Riis observed that the Global CCS Institute is already performing knowledge sharing more broadly and comprehensively than the CSLF probably could ever do, and questioned the need for forming a new Task Force or undertaking any other activities in this area. However, Stefan Bachu noted that all of the large CSLF-recognized projects that receive government support have requirements for knowledge sharing, and could effectively do so through a new or existing CSLF Task Force. Clinton Foster suggested that the PIRT would be the logical Technical Group point of contact, for knowledge sharing purposes, with project representatives and also the Global CCS Institute. Information obtained by the PIRT from the projects would be used to populate the Institute's knowledge sharing platforms. There was agreement to proceed in this fashion, and for the PIRT to have main responsibility for the "Best Practices Knowledge Sharing" action. Dr. Foster noted that this approach, combined with the series of successful Technical Workshops that have been organized by the Technical Group, are the beginnings of a technical communication strategy for disseminating knowledge and information.

Stefan Bachu also noted that two other actions in the Action Plan are already being addressed. The action on "Risk and Liability" is being covered by the new Joint Policy and Technical Group Task Force on this topic, while the IEA GHG will soon be

publishing a report that appears to address the “Competition of CCS with Other Resources” action. There was agreement that the Technical Group would not address the “Risk and Liability” actions, and would continue to defer any activity toward the “Competition of CCS with Other Resources” action pending review of the IEA GHG report.

Philip Sharman suggested that two other actions in the Action Plan were also being addressed. The Clean Energy Ministerial (CEM) and the IEA are producing a high-level appraisal paper on how industrial emissions relate to CCS, and this would relate to the action on “CCS with Industrial Emissions Sources”. This appraisal paper may well establish the basis for a new Technical Group Task Force, but it was proposed and agreed that the Technical Group should defer action in this area so as not to preempt the CEM report. Concerning the action on “Energy Penalty Reduction”, Mr. Sharman stated that the United Kingdom’s Department of Energy and Climate Change (DECC) already has a Cost Reduction Task Force that is in the final stages of completing a report on this topic, and that it also could be the basis for future Technical Group activities, if necessary. Mr. Sharman was requested to send a copy of the DECC report to the Secretariat, once it is available, so that the Secretariat can disseminate it to the Technical Group delegates. There was agreement to defer any activity in this area pending review of the report.

Mr. Riis noted that, as a result of activities undertaken by various organizations, including CSLF Task Forces, 9 of the 12 actions in the Action Plan are now being addressed. Mr. Panek reminded delegates that the Technical Group’s Action Plan is a living document and is open to amendment for new actions. Ideas for additional actions and Task Forces are always welcome.

14. Report from Technical Challenges for Conversion of CO₂-EOR to CCS Task Force

The Task Force Chair, Stefan Bachu, provided a short summary about the Task Force and its activities. At the 2011 CSLF Ministerial in Beijing, there was renewed emphasis on CO₂ utilization, and adoption of the new Technical Group Action Plan resulted in creation of this Task Force and also the CO₂ Utilization Options Task Force. The latter covers all other forms of CO₂ utilization except enhanced oil recovery (EOR), which is being addressed by this Task Force. The most prevalent form of CO₂ utilization, CO₂-EOR, is a proven technology with more than 120 operations worldwide. Dr. Bachu stated that the Task Force’s mandate was to review, compile and report on technical challenges that may constitute a barrier to the broad use of CO₂ for EOR and to the conversion of CO₂-EOR operations to CCS operations. Economic and policy barriers would be outside the scope of the Task Force.

Dr. Bachu stated that the Task Force will produce a report that identifies these technical challenges and also any regulatory issues that involve technical aspects. An initial draft will be ready in time for the next Technical Group meeting, in the 2nd quarter of 2013. After comments from the Technical Group have been incorporated, a finalized version of the report will be ready for the 2013 CSLF Ministerial Meeting. Topics to be covered by the report include characteristics of CO₂-EOR operations (objectives, suitability, operational aspects, monitoring & surveillance, regulatory requirements), characteristics of CO₂ storage operations (objectives, suitability, operational aspects, monitoring & surveillance, regulatory requirements), and transitioning from CO₂-EOR to CCS (commonalities and differences, operational scenarios, storage integrity, monitoring and regulatory requirements). Dr. Bachu also mentioned the composition of the Task Force,

with confirmed representation from Brazil, Canada (as chair), China, Mexico, Norway, Saudi Arabia, and the United States.

15. Report from CO₂ Utilization Options Task Force

The Task Force Chair, Darren Molloy, gave a brief summary of the Phase 1 Task Force report and outlined Phase 2 activities. The Task Force is focused on all forms of CO₂ utilization except CO₂-EOR, and the mission is to identify/study the most economically promising CO₂ utilization options that have the potential to yield a meaningful, net reduction of CO₂ emissions, or facilitate the development and/or deployment of other CCS technologies. The Task Force is currently comprised of China, Germany, the Netherlands, Saudi Arabia, South Africa, the United Kingdom, and the United States (as Chair).

Dr. Molloy stated that the Task Force activities are being done in two phases. Phase 1 is completed and has resulted in a report that summarizes current knowledge of the use and re-use of CO₂ and provides a broad listing of CO₂ utilization opportunities. During the course of the meeting, the Task Force selected eight technologies as a first cut of those that would undergo further evaluation as part of Phase 2. These technologies fall into three categories: resource recovery (enhanced gas recovery; shale gas recovery; fracturing using CO₂), non-consumptive (urea production; algal fuels; use in greenhouses), and consumptive (synthetic aggregates / supplementary cementitious material; CO₂-assisted geothermal power production). Each technology selected had at least one Technical Group delegate who will champion and lead the assessment effort. The Phase 2 activities will focus on the most attractive CO₂ utilization options, based on economic promise and CO₂ reduction potential, and will include an assessment of current and potential economic viability, estimation of CO₂ reduction potential at various price points, examination of the potential for co-production, and a discussion of RD&D needs. The Task Force's Phase 2 report is planned for completion in time for the next Technical Group meeting, in the 2nd quarter of 2013.

Ensuing discussion centered on the Task Force's Phase 2 activities. Jeroen Schuppers stated that the European Commission is sponsoring several related studies that could be relevant to the Task Force's discussion on RD&D needs. Dr. Schuppers agreed to provide Dr. Molloy the relevant results from these studies, once confidentiality requirements have been addressed. Jostein Dahl Karlsen inquired if the Task Force set its scope to coincide with the year 2020 time horizon of the TRM. Dr. Molloy replied that the Task Force is looking at both near-term and longer-term options and is not necessarily limiting itself to a 2020 cut-off date.

16. Report from Monitoring Geologic Storage for Commercial Projects Task Force

Trygve Riis, speaking on behalf of Task Force Chair Lars Ingolf Eide, gave a brief update on the Task Force and its activities. The Task Force mandate is to perform initial identification and review of standards for storage and monitoring of injected CO₂. Economic and policy issues would be outside the scope of the Task Force. Task Force membership currently includes representation from China, Denmark, the European Commission, France, Germany, the IEA GHG, the Netherlands, Norway (as Chair), the United Kingdom, and the United States.

Mr. Riis stated that the current work plan includes identification and review existing standards for geological CO₂ storage and monitoring (on an annual basis); identification of shortcomings and/or weaknesses in standards/guidelines; communication of findings to

the Technical Committee on CCS of the International Organization for Standardization (ISO); producing annual summaries of new as well as updated standards, guidelines and best practice documents regarding geological storage of CO₂ and monitoring of CO₂ sites; and following the work of other organizations related to CO₂ storage. However, the Task Force is not yet scheduled to go beyond 2013, and the future of the Task Force will be decided at the 2013 CSLF Ministerial Meeting.

Mr. Riis reported that the Task Force is on a timeline that will produce its first annual report before the end of 2012. A draft version of the report has already been completed and includes an initial compilation of standards, best practices, and guidelines for storage and monitoring of injected CO₂. Preliminary conclusions are that site selection, monitoring / verification, and risk assessment are best covered by existing standards, Best Practices Manuals (BPMs), or guidance documents, but none of the BPMs reviewed by the Task Force covered all topics of interest.

Ensuing discussion focused on the overall scope of the Task Force. Stefan Bachu mentioned that the original scope of the Task Force, as decided at the Bergen meeting, was only for monitoring of stored CO₂ and not of other issues such as storage capacity estimation and site selection. Mr. Riis stated that he would inform Mr. Eide of this concern and that the Task Force membership would need to resolve it. Jeroen Schuppers mentioned that the European Commission has several projects, most notably the recently-completed ReMoVe Project, that examined monitoring/verification best practices and technologies. Dr. Schuppers mentioned that results from these projects would be a good input to the Task Force and agreed to provide Mr. Eide relevant information as it becomes available. As for coordinating Task Force activities with the ISO, Dr. Bachu stated that the ISO and its committees proceed at a completely different and necessarily much slower pace than the CSLF. It would therefore be very unlikely that the Task Force would get any useful information from the ISO in time for the 2013 CSLF Ministerial Meeting. Ahmed Aleidan inquired if outcomes from the Task Force would be binding in any way, and Mr. Riis responded that the Task Force was formed only to review existing standards, not to create new ones.

17. Status of Proposed CSLF Liaison with the ISO

John Panek provided a brief summary of the CSLF's request to the ISO for liaison status. At the Bergen meeting, the Task Force on Monitoring Geologic Storage for Commercial Projects had recommended that the CSLF request a formal liaison with the ISO Technical Committee on CO₂ Capture, Transportation and Geological Storage (ISO/TC 265). To that end, the CSLF Policy Group Chair, in August, sent a letter to the ISO/TC 265 Secretariat that requested liaison status. Mr. Panek stated that a response was received that requested additional information about the CSLF, and this was provided to the ISO/TC 265 Secretariat in late September.

Stefan Bachu, who is a member of the ISO/TC 265, added that he had received an email announcement the previous day that had requested the ISO/TC 265 membership to vote on the proposed admission of the CSLF to liaison status. However, Dr. Bachu did not know when the result would be announced.

Trygve Riis noted that the CSLF had requested liaison as a "Category A" organization, which is the most active status, and asked who would participate on behalf of the CSLF if liaison status is approved. Mr. Panek responded that the Secretariat would coordinate with the Technical Group Executive Committee in that regard, and that both the United States delegation and the Secretariat have expressed willingness to participate as

necessary on behalf of the CSLF. Mr. Panek also stated that the Secretariat would notify Technical Group delegates concerning the outcome of its application, once it is known.

18. Review of 2013 CSLF Ministerial Concept Paper

Trygve Riis stated that a draft Concept Paper had been prepared by the CSLF Secretariat for the upcoming 5th CSLF Ministerial Meeting, and that the Technical Group had been asked to review it. A robust discussion ensued, with many delegates providing their comments on various parts of the document. In the end, there was consensus that the paper needed a major rewrite and that the following recommendations be provided to the Policy Group.

- The proposed theme for the Ministerial Conference, “The Business Case for CCUS: Carbon Utilization to Meet Energy Sustainability, for Economic Development and to Fight Poverty”, should be re-thought. In particular, “...to Fight Poverty” is outside the scope of the CSLF and is therefore not credible.
- There is confusion in use of the terms “CCS” and “CCUS” in the paper. The terms are not interchangeable, and should not be used interchangeably.
- CO₂-EOR is an important bridge to CCS but it is not applicable to all countries. The Concept Paper should not give exclusive emphasis to CO₂-EOR, as this may be a disincentive for some Ministers to participate.
- Technical Group activities should be featured more prominently. These include the TRM, the new Task Forces that are addressing the Action Plan, and collaboration with outside organizations.
- The Concept Paper should convey the following messages:
 - CO₂ storage is the issue, not EOR. Therefore, “The Business Case for CCUS...” is not appropriate for the proposed theme.
 - Geologic storage of CO₂ is safe with proper operation.
 - There is a need for large-scale demonstration CO₂ storage projects.
 - There is a need for policy and regulatory clarity regarding CO₂ storage.

19. Dates and Locations of Future CSLF Technical Group Meetings

Giuseppe Girardi stated that Italy would like to host the next CSLF Technical Group meeting in Rome during the week of April 15-19, 2013. The meeting would include a Technical Workshop and a visit to a site near Rome where natural emissions of CO₂ occur. The Technical Group offered its thanks and accepted the offer.

Mr. Panek also stated that he had been notified by Korea’s delegation that it would like to host the 2014 Technical Group meeting. Possible dates for the meeting would be forthcoming later. The Technical Group again offered its thanks and accepted the offer.

20. Planning for 2013 Technical Workshop

John Panek reported that planning for next year’s Technical Workshop will be coordinated with the Italian hosts. This will be a Monitoring-themed Workshop and Stefan Bachu has agreed to provide his assistance in developing ideas for the Workshop sessions and in suggesting possible participants from the portfolio of CSLF-recognized projects. Mr. Panek stated that as soon as details firm up, the Secretariat would inform the Technical Group.

21. Election of Technical Group Chair and Vice Chairs

Trygve Riis requested that John Panek oversee the meeting for this agenda item. Mr. Panek stated that according to the CSLF Terms of Reference and Procedures, CSLF Chairs and Vice Chairs will be elected every three years. The previous election of the Technical Group Chair and Vice Chairs was at the London meeting in October 2009, and it was now time for another election.

By consensus, Norway was re-elected as Chair, and Australia, Canada, and South Africa were elected as Vice Chairs.

22. New Business

There was no new business.

23. Review of Consensuses Reached and Action Items

Consensus was reached on the following:

- The Technical Group will henceforward use a simplified and more concise version of the Gaps Analysis Checklist for use by projects requesting CSLF recognition.
- The South West Hub Geosequestration Project and the CarbonNet Project are recommended by the Technical Group to the Policy Group for CSLF recognition.
- The schedule for producing the 2013 TRM is accepted.
- The PIRT will act as main Technical Group point of contact, for knowledge sharing purposes, with CSLF-recognized projects and the Global CCS Institute, and will be responsible for any activities on the Action Plan for “Best Practices Knowledge Sharing”.
- The Technical Group will not address the Action Plan on “Risk and Liability”, as there is a Joint Policy and Technical Group Task Force that has been formed to address this topic.
- The Technical Group will defer addressing the Action Plan on “Competition of CCS with Other Resources” until after publication and review of a report by the IEA GHG related to this topic.
- The Technical Group will defer addressing the Action Plan on “CCS with Industrial Emissions Sources” until after the publication and review of a report by the Clean Energy Ministerial on this topic.
- The Technical Group will defer addressing the Action Plan on “Energy Penalty Reduction” until after the publication and review of a report by the United Kingdom’s Cost Reduction Task Force on this topic.
- The Technical Group recommends that the draft of the Ministerial Concept Paper be rewritten.
- Italy will host the 2013 Technical Group meeting in Rome during the week of April 15-19.
- Korea will host the 2014 Technical Group meeting.
- Norway is elected Technical Group Chair.
- Australia, Canada, and South Africa are elected Technical Group Vice Chairs.

Action items from the meeting are as follows:

Item	Lead	Action
1	Technical Group Chair	Provide the Technical Group's recommendation to the Policy Group that the South West Hub Geosequestration Project and the CarbonNet Project be recognized by the CSLF. <i>(note: this was done at the Joint Meeting of Policy and Technical Groups on October 26)</i>
2	United Kingdom	Provide a copy of DECC's Cost Reduction Task Force report to the Secretariat as soon as it is available.
3	Secretariat	Send copies of DECC's Cost Reduction Task Force report to Technical Group delegates.
4	European Commission	Provide relevant results from the various CO ₂ utilization studies it is sponsoring to the CO ₂ Utilization Options Task Force.
5	European Commission	Provide relevant results from the various projects it is sponsoring to the Monitoring Geologic Storage for Commercial Projects Task Force.
6	Secretariat	Inform Technical Group delegates the outcome, once it is known, of the CSLF application for liaison status with the ISO/TC 265.
7	Technical Group Chair	Provide the Technical Group's critique of the Draft Ministerial Concept Paper to the Policy Group. <i>(note: this was done at the Joint Meeting of Policy and Technical Groups on October 26)</i>

24. Closing Remarks / Adjourn

Trygve Riis thanked the delegates, observers, and Secretariat for their hard work and active participation in the meeting, and expressed his appreciation to the Australian Government and other meeting sponsors. Mr. Riis stated that there had been an illuminating discussion about the 2013 Ministerial Meeting as well as good progress on the TRM and by the Task Forces.

Mr. Riis reminded attendees of the next day's Joint Meeting of the Policy and Technical Groups and adjourned the meeting.