



**Minutes of the Policy Group Meeting
Tokyo, Japan
October 7, 2016**

LIST OF ATTENDEES

Policy Group Delegates

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| Australia: | Josh Cosgrave, Tim Sill |
| Brazil: | Paulo Vinícius Garcia |
| Canada: | Geoff Murphy, Mike Monea |
| Czech Republic: | Pavel Kavina, Richard Nouza |
| France: | Didier Bonijoly |
| Italy: | Sergio Persoglia |
| Japan: | Wataru Matsumura, Takashi Kawabata, Takuro Okajima |
| Korea: | Joung-ki Kim, Chong Kul Ryu, Chang-Keun Yi |
| Norway: | William Christensen, Stig Øyvind Uhr Svenningsen |
| Poland: | Anna Marta Madyniak |
| Saudi Arabia: | Fahad Almuhaish (Vice Chair), Ammar Alshehri |
| United Kingdom: | Brian Allison (Vice Chair) |
| United States: | Jarad Daniels (Chair), Cameron Salony |

Representatives of Allied Organizations

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| Global CCS Institute: | Alex Zapantis, Kazuko Miyashita |
| IEA: | Tristan Stanley |
| IEAGHG: | Tim Dixon |

CSLF Secretariat

Stephanie Duran, Richard Lynch, Adam Wong

Invited Speakers

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| Asian Development Bank: | Shannon Cowlin |
| Canada: | Dave Malloy, University of Regina |
| France: | Dominique Copin, Total |
| Japan: | Ryozo Tanaka, Research Institute of Innovative Technology for the Earth (RITE) Kenji Yamaji, RITE |
| Norway: | Åse Slagtern (Technical Group Chair) |
| United States: | Sallie Greenberg, University of Illinois John Thompson, Clean Air Task Force Barry Worthington, United States Energy Association |

Observers

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| Australia: | Andrew Barrett, Max Watson |
| Canada: | Eddy Chui |
| Japan: | Junko Hirai, Takashi Honjo, Masanao Kikuchi, Toshihiko Miyagawa, Kimiko Nakanishi, Hideo Nomoto, Nobuo Takasu, Jiro Tanaka, Kenji Yamaji |
| United States: | Roger Aines, Sean McCoy |

1. Welcome and Opening Statement

Jarad Daniels, Policy Group Chair, United States, called the meeting to order and thanked the Ministry of Economy, Trade and Industry of Japan, along with the Research Institute of Innovative Technology for the Earth (RITE), for hosting.

2. Meeting Host's Welcome

Wataru Matsumura, Director of the Global Environment Partnership Office, METI, Japan, welcomed the attendees and provided the host country remarks. He stressed the importance that carbon capture and storage (CCS) technology must play an important role in the energy and environment. The CSLF can play an important role to show the value of CCS.

3. Climate Goals and CCS

Kenji Yamaji, RITE, Japan, provided an update on climate goals and CCS, while also summarizing the recent development of climate policy in Japan. The 2015 United Nations Climate Change Conference, COP 21, successfully adopted the Paris Agreement which requires all nations to submit Intended Nationally Determined Contributions (INDCs), and states long-term targets including a 2°C target. However, there are several scientific and policy uncertainties even for the 2°C target. There are still large uncertainties in climate sensitivity, and the allowable emissions vary widely even for a specific level of temperature rise target, such as the 2°C target. The 2030 global emission expected by the submitted INDCs has large gaps from the emission pathways for the 2°C target with a high climate sensitivity and a high achieving probability, but is consistent with those under a low climate sensitivity. It is important to seek deeper emission reduction possibilities through developments and deployments of innovative technologies. CCS is indispensable to achieve net zero greenhouse gas (GHG) emissions by 2100.

4. Introduction of Delegates

Policy Group delegates introduced themselves. Thirteen of the twenty-six CSLF Members were present, including representatives from Australia, Brazil, Canada, Czech Republic, France, Italy, Japan, Korea, Norway, Poland, Saudi Arabia, the United Kingdom, and the United States.

5. Adoption of Agenda

The Agenda was adopted without change.

6. Review and Approval of Minutes from London Meeting

The Minutes from the CSLF Policy Group Meeting on June 30, 2016, in London, United Kingdom were approved without change.

7. Review of London Meeting Action Items

Stephanie Duran, CSLF Secretariat, provided a brief summary of the action items from the CSLF Policy Group Meeting on June 30, 2016, in London, United Kingdom. All action items have been completed or are currently in progress.

8. Consideration of Applications for CSLF Membership

The Policy Group voted to approve and welcome the Czech Republic as the 26th member of the CSLF.

9. Report from CSLF Technical Group

Åse Slagtern, Technical Group Chair, Norway, provided a summary of the Technical Group activities from the recent CSLF Technical Group Meeting on October 4, 2016. At the Technical Group Meeting, technical CSLF topics included an update on CCS activities in the Japan, a discussion on engaging CSLF projects, a report on results from the CSLF-recognized project “CO₂ Separation from Pressurized Gas Stream Project.” Invited presentations included a presentation on life-cycle emissions estimates for bio-fuels with CCS, a presentation on possible pathway to low-carbon lignite utilization, and a presentation on possible ways of transforming CO₂ into commercial products. There were also updates from three Technical Group task forces: the Off-Shore CO₂-EOR Task Force, the Bioenergy with CCS Task Force, and the Improved Pore Space Utilisation Task Force.

The Technical Group is also preparing the 2017 CSLF Technology Roadmap (TRM), which will be a refresh of the existing TRM to incorporate outcomes from COP21. A final draft is expected at the 2017 CSLF Mid-Year Meeting, and a finalized TRM will be a deliverable at the 2017 CSLF Ministerial Meeting. Meeting outcomes included a new task force on Industrial CCS (chaired by France), a possible new task force on regulation (proposed by Japan), and a strategy for engaging CSLF-recognized projects.

Two new projects were recommended for CSLF recognition: the Tomakomai CCS Demonstration Project and the NET Power 50 MW_{th} Allam Cycle Demonstration Project. The Policy Group accepted the Technical Group’s recommendation and approved both projects as CSLF-recognized projects.

10. Summary of CSLF Workshop

Ryozo Tanaka, RITE, Japan, provided a summary of the 2016 Technical Workshop on October 5, 2016. This technology-oriented workshop had three themes: Input to Ongoing and Potential CSLF Taskforces; Knowledge sharing from CSLF-recognized projects; and Potential Industrial CCS Projects. The workshop also included an introduction of Japan-involved projects, as six out of twelve presentations involved Japan. More than 100 participants, including CSLF members, GCCSI Japanese members, and RITE partners, participated in this workshop.

11. Summary of Innovation for Cool Earth Forum (ICEF) CCS Session

Tim Dixon, IEA Greenhouse Gas R&D Programme (IEAGHG) provided a summary of the Innovation for Cool Earth Forum (ICEF) CCS Session on October 5, 2016. The ICEF CCS Session focused on more policy based issues, and its objectives were to discuss lessons and challenges in scaling up CCS in the context of the COP21 Agreement. Key conclusions included a need for policy parity for CCS (magnitude of support); a need for

policy and regulatory certainty and stability; and to further encourage international technology knowledge sharing.

12. Report from CSLF Stakeholders

Barry Worthington, Executive Director of the United States Energy Association, provided a CSLF Stakeholders' Message to the Policy Group. Since 2003, stakeholder participation has been varied, and generally increases at ministerial meetings. The location often plays a factor, and diminished travel budgets have reduced the ability of key players to participate, such as oil, gas, and coal industries. The CSLF Stakeholders proposed a new approach to conduct four regional meetings before the 2017 CSLF Ministerial Meeting. At each regional meeting, a regional action will be spearheaded by a nominated champion, while a universal survey will also be distributed to gather baseline data throughout all four regionals. Information from taskforces, the secretariat survey, and written statements from regional meetings will be synthesized by all four champions into a set of recommendations to be delivered at the ministerial meetings.

Members were asked to forward suggested regional CCS champions to the CSLF Secretariat. The CSLF Secretariat will send a list of CSLF stakeholders to members.

13. CCS Project Updates

Jarad Daniels, Policy Group Chair, United States, provided an update regarding four major CCS demonstration projects in the United States, including:

- Southern Company Services, Inc. CCPI-2 - Kemper County Advanced IGCC with CO₂ Capture
- Petra Nova – NRG W.A. Parish CCPI-3 - Advanced Post Combustion CO₂ Capture
- Air Products & Chemicals, Inc. ICCS Area 1 - Steam Methane Reforming with CO₂ Capture
- Archer Daniels Midland Company ICCS Area 1 - CO₂ Capture from Biofuel Plant

All four projects either have, or will, be starting soon.

William Christensen, Norway, provided an update on the Norwegian CO₂-capture, transport and storage project. Norway has 20 years of experience with CCS, including three projects: Sleipner, TCM, and Snøhvit. Feasibility studies for Norwegian CCS projects look at all parts of the CCS chain, including capture, transport, and storage. Framework conditions and financing include tailor made solutions for a first project, costs and risk must be shared between state and industry, and the state will have to take the largest part of the costs for all parts of the CCS chain.

The Policy Group then held a discussion on the need to look at legal and regulatory issues, potentially jointly done with the Technical Group. Japan suggested that the Policy Group establish a regulatory task force to discuss “reasonable” regulations and gather information from existing projects. Canada, Japan, the United States, and the IEA, agreed to form a committee to continue the discussion and suggest a path forward for a potential task force on this topic. The United States would also reach out to the European Commission to potentially join the discussion.

14. Financing CCS

Shannon Cowlin, Asian Development Bank (ADB), presented on “Financing Pathways for CCS in Emerging Economies.” The ADB mission and energy approach is to help its

developing member countries reduce poverty and improve the quality of life of their people, and thus its Energy Policy Pillars include the need to promote energy efficiency and renewable energy; maximize access to energy for all; promote energy sector reform, capacity-building, and governance; and support for CCS to be provided as it becomes technically feasible and economically viable. CCS in ADB's developing member countries are generally countries with a heavy fossil future, and a good source of sink opportunities. CCS does have a number of current risks that must be addressed.

Current ADB CCS activities include:

- ADB established a dedicated CCS Fund with contributions from the Global CCS Institute (AUD 21.5 m) and UK Government (£ 35 m)
- Has supported upstream analyses and capacity development activities to build a case for CCS demonstration
- Supported development of CCS roadmaps
- Establishing Centers of Excellence in China and Indonesia Aims to support pilots

Early lessons and questions include transaction cost, lack of regulation, technical challenges, monitoring and verification, and operation timeframe. It was suggested that the CSLF needs to examine how to translate site-specific details to general guidance, while also determining a strategic role for government.

15. Environmental Non-Governmental Organization (ENGO) Perspectives on CCS

John Thompson, Clean Air Task Force, provided Environmental Non-Governmental Organization (ENGO) Perspectives on CCS. CCS progress has stalled due to technology assessments, storage capacity assessments, sink-source matching, technical-economic modeling, and identifying barriers. The policy needs depend on the CCS stage, which includes demonstration, hub, and option creation.

16. Report from the Communications Task Force

Stephanie Duran, CSLF Secretariat, provided an update from the CSLF Communications Task Force. Key activities in 2016 include:

- Website re-development, led by Secretariat
- Strategic stakeholder engagement plan for CSLF around core 2016-17 events, including proposal for introducing high-level messages on CCS at COP22
- Development of media kit, including CSLF backgrounder, to be expanded in 2017
- Working with GCCSI and IEAGHG to coordinate strategic interventions at COP22, Marrakech

The CSLF plans to highlight CCS at COP22 by disseminating a welcome letter to new UNFCCC Executive Secretary Patricia Espinosa introducing the role of the CSLF, while also sharing the 2015 Communique and highlighting the importance of CCS technologies to global climate goals. The CSLF will also provide a CSLF media kit for dissemination at CCS side events, and where feasible, live broadcast CCS side events on the CSLF website. It was agreed that the welcome letter should potentially come from the United States Secretary of Energy Ernest Moniz, either with or without Saudi Arabia, as chair of the most recent CSLF Ministerial Meeting in 2015.

17. CSLF Website Launch

Stephanie Duran, CSLF Secretariat, presented the new remodeled CSLF website. It was suggested that the CSLF Secretariat add a “button” on the homepage for the press and media.

18. Report from the Capacity Building Governing Council

William Christensen, Capacity Building Governing Council Chair, Norway, summarized the status of the CSLF Capacity Building Program. The CSLF Capacity Building Fund was established by the CSLF Ministers at the 2009 CSLF Ministerial in London, and contributions committed total US \$2,965,143.75, with donors from Australia (via the Global CCS Institute), Canada, Norway, and the United Kingdom. To date, the Governing Council has approved 19 capacity building projects in 6 countries, with 12 projects completed, 6 projects in progress, and 1 project on hold. Current next steps include four tentative proposed projects to be negotiated (two from Brazil, one from Serbia, and one from South Africa), the India project is still on hold, and a Governing Council meeting is to be held, likely via teleconference, before the end of 2016.

19. Report from the CSLF Academic Council

Sallie Greenberg, University of Illinois and Dave Malloy, University of Regina provided a report from the CSLF Academic Council. In discussions following the Academic Council meeting on June 27, 2016 in London, United Kingdom, the group agreed to combine two themes and concentrate recommendations on: Student Training, Practical Learning, and Curriculum Development Communications and Outreach Academic Community and Capacity Building.

Conclusions reached include:

- CCS activities are widespread across academic institutions
- It is imperative that the next generation of researchers are identified and supported through exchanges, credit transfers, and exposure to cutting edge technology

Next Steps include

- As we move forward with academic pursuits to build capacity and further CCUS, we will bridge technical and policy with attention to the non-technical issues and methods of communication
- Explore the notion of a CSLF Task Force on CCS Public Policy & Social Values.

20. International Energy Agency (IEA) CCS Activities Update

Tristan Stanley, International Energy Agency (IEA), presented on CCS activities within the International Energy Agency. His presentation provided an update on investment in energy, with a focus on regional and sector trends, as well as investment in large-scale CCS projects over the past ten years. Recent and upcoming events were showcased, such as the 20th anniversary of the Sleipner project CCS Project and the IEA GHGT-13 Conference, as well as the release of *20 Years of CCS: Accelerating Future Deployment*. The report highlights the need for accelerated deployment and industrial CCS in meeting emissions targets.

21. Global CCS Institute Update

Alex Zapantis, Global CCS Institute (GCCSI), presented an update on the global status of CCS. Globally, there are 15 large scale CCS projects in operation, with seven expected to become operational in 2016-17. Most projects in the pipeline are in power generation, with the remainder in industrial settings. Barriers to deployment still remain, but policy can be a significant enabler. CCS will need to play a larger role alongside other

technologies, but adequate investment and deployment remain challenges. The success of renewable energy technologies is used as an example to demonstrate the need for a strong policy framework.

22. Oil and Gas Climate Initiative Update

Dominique Copin, Total, presented on behalf of the Oil and Gas Climate Initiative (OGCI), providing an overview of the OGCI and its work streams, which include the key areas of natural gas and methane, low emission road map, and long term solutions. The CCS work programs focus on pathways to market commercialization, natural gas capture technologies, and storage capacity in key markets, with an emphasis on the need for cost reduction in the first two areas. Technology development and collaboration are necessary for achieving the goals under these three work programs. The OGCI's current membership includes BP, CNPC, Eni, PEMEX, Reliance Industries, Repsol, Saudi Aramco, Shell, Statoil, and TOTAL. OGCI also works with the IEA, GCCSI, the Carbon Capture and Storage Association (CCSA), and the Society of Petroleum Engineers (SPE). An Annual Report is slated to be released in October 2016.

23. Upcoming Events (Mission Innovation, Clean Energy Ministerial, COP22)

Jarad Daniels, Policy Group Chair, United States, led the discussion on upcoming high-level multilateral events that included a number of member-country Ministers. It was suggested that CSLF members use some of these events to explain what CCS can deliver, while also focusing on how carbon taxes or other incentives can help accelerate CCS.

24. Election of Policy Group Vice Chairs

China, Saudi Arabia, and the United Kingdom were nominated and elected to continue in their roles as Policy Group Vice Chairs, for a term ending in 2018.

25. Future CSLF Meetings

Stephanie Duran, CSLF Secretariat, stated that planning was underway for 2017 CSLF meetings, but there was not yet confirmation on the host for the 2017 Mid-Year meeting. An announcement would be forthcoming within the next 1-2 months. In regards to the 2017 CSLF Ministerial Meeting, it was suggested that the planned Ministerial Communiqué feed into the argument for greater than 2°C target.

26. Open Discussion and New Business

No new business was discussed. Japan volunteered to host, via the Japan CCS Co. (JCCS), the Asia/Pacific regional stakeholder event.

27. Action Items and Next Steps

Stephanie Duran, CSLF Secretariat, provided a summary of the day's Policy Group Meeting, and noted the significant agreements and action items. The Policy Group reached a consensus on the following items:

- Approved the Tomakomai Project and NetPower program for CSLF recognition; both projects will be added to the CSLF website
- Welcomed the Czech Republic as the 26th member of the CSLF
- Agreed to look into an exploratory committee to evaluate regulatory issues and a potential new taskforce, with action to create strategic guidelines for possible responsibilities under this taskforce by the Mid-Year Meeting
- Agreed that the CSLF Secretariat would pursue an open letter signed by Secretary Moniz and Minister Al Falih in Saudi Arabia

- Endorsed Academic Council recommendations; the Academic Taskforce will work with the Academic Council to implement those and report out at the Mid-Year Meeting
- Saudi Arabia, China, and the United Kingdom were elected for another term as Policy Group vice chairs through 2018
- Japan has nominated the Japan CCS Company (JCCS) for the Asia-Pacific regional champion for stakeholder engagement

Action items from the meeting are as follows:

| Item | Lead | Action |
|------|---|---|
| 1 | All regions | Each region should identify a stakeholder champion and provide recommendations to the Secretariat by the end of October |
| 2 | CSLF Secretariat | Send a list of current stakeholders to the Policy Group chairs for their review and input |
| 3 | Barry Worthington/USEA | Send out the survey on stakeholder engagement; this will also be disseminated through the Policy Group leads |
| 4 | CSLF Secretariat | Distribute the media kit by the end of October for feedback; it will be a “living” document |
| 5 | CSLF Secretariat in coordination with Sallie Greenberg and Mike Monea | Evaluate how to plug into public policy and social values proposal with recommendations to the Mid-Year Meeting |
| 6 | CSLF Member Countries | Provide to the Secretariat any dates of conflict to avoid for scheduling the Mid-Year Meeting, preferably by end of the calendar year |
| 7 | CSLF Secretariat | Initiate drafting process for the 2017 CSLF Ministerial Communique |

28. Closing Remarks / Adjourn

Jarad Daniels, Policy Group Chair, United States, closed the meeting. He recognized and again welcomed the CSLF’s newest member, the Czech Republic. He also highlighted the approval of two new CSLF-recognized projects. He thanked all of the participants and by thanking the government of Japan for hosting the event.