



TECHNICAL GROUP

Simplification of CSLF Gaps Analysis Checklist

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CSLF IS GOING GREEN*

SIMPLIFICATION OF CSLF GAPS ANALYSIS CHECKLIST

Note by the Secretariat

Background

Proposed simplification of the CSLF Gaps Analysis Checklist has been the subject of extensive discussions at the Beijing Projects Interaction and Review Team (PIRT) and Technical Group meetings in September 2011 and also the Bergen PIRT and Technical Group meetings in June 2012. In September 2012, the Secretariat sent PIRT delegates a proposal from the PIRT Chair for simplifying the Gaps Analysis Checklist down to a smaller and more manageable number of categories. Responses from PIRT delegates indicated they were overwhelmingly in favor of this simplification, with minor modifications. This paper presents the PIRT Chair's original proposal for simplification of the Checklist, a summary of responses from PIRT delegates on the proposal, and also a comprehensive analysis, done by the PIRT Chair, matching the existing CSLF-recognized projects to the revised Checklist.

Action Requested

The Technical Group is requested to review the revised Gaps Analysis Checklist and analysis of CSLF-recognized projects under the revised Checklist.

* **Note:** This document is available only electronically. Please print it prior to the CSLF meeting if you need a hardcopy.

SEEKING RESOLUTION OF THE SIMPLIFICATION OF *CSLF GAPS ANALYSIS CHECKLIST* THAT ACCOMPANIES THE *CSLF PROJECT SUBMISSION FORM*

Clinton Foster

Chair - CSLF Projects Interaction and Review Team

Vice Chair – Australia CSLF Technical Group

PROPOSITION

- That the members of the CSLF Projects Interaction and Review Team (PIRT) vote, out of session, and via reply email, to agree to a simplified version of *CSLF Gaps Analysis Checklist* (the *Checklist*) that accompanies the *CSLF Project Submission Form*.
- The proposed *Checklist* is set out below: it reduces from 7 A4 printed pages to 1 A4 page. Using the simplified categories, all the existing CSLF Projects can be characterised for further analysis (see Attachment).
- With majority agreement of PIRT members, this proposition will be noted at the next PIRT meeting (Perth) and the TG will be asked to both note and confirm the changes at the Perth meeting.

The proposed Checklist (as submitted to the PIRT meeting in Beijing)

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	

STORAGE (& MONITORING) TECHNOLOGIES

Storage Complex Type	
Saline formations	
Unconventional reservoirs (e.g. basalt, shale)	
Unmineable coal formations	
EOR and/or EGR	

Storage complex characterization	
CO ₂ -water-rock (or coal) interactions	
Impact of the quality of CO ₂ on storage	
Improved modelling of complex	
Effects of depth, pressure and stress and CO ₂ -rock/water interactions 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	

TRANSPORT

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

Background and discussion

- This proposition is an outcome of the Warsaw TG and the action has been discussed at PIRT and TG meetings since 2010: but without clear resolution.
- It became clear from the Working Groups (WGs) of the recently completed Task Force *Assessing Progress on Technical Issues Affecting CCS*, that the *Checklist* that accompanied the *Project Submission Form* was inadequate in that many more gaps/issues were identified by the WGs, but it also raised the questions of:
 - how detailed (or granular) the *Checklist* should be; and
 - what was the purpose of the *Checklist*?
- Both questions have been discussed in CSLF meetings in Edmonton, Warsaw, and Beijing and relevant comments are chronicled below
- Put simply the original purpose of the *Checklist* was to check if gaps (as identified at that time) were being filled by projects put forward for CSLF recognition. But the level of sophistication of the answer to that question has changed, as evidenced by the detailed WGs findings. Moreover, anecdotal evidence to me as PIRT Chair, and to other members of the PIRT and the Secretariat, is that the *Checklist*, as it currently stands, is seen as *too detailed and confusing* and, as a result, not always filled in correctly.
- The simplified list captures the relevant information and allows the CSLF Projects to be categorised (see Attachment)

CHRONOLOGY OF THE RECENT REVISION OF THE *CSLF PROJECT SUBMISSION FORM* (approved Pau, March 2010) AND THE ATTEMPTS TO SIMPLIFY THE *CSLF GAPS ANALYSIS CHECKLIST* (as empowered Warsaw October 2010; and discussed May 2011 Edmonton; September 2011, Beijing; and Bergen, June 2012)

Background – reference documents

1. Approval of a revised *CSLF Project Submission Form*

1.1 March 15-16 Pau, 2010

<http://www.csforum.org/publications/documents/Pau2010/PIRTSummaryPau0310.pdf>

March 15-16 Pau

Other actions by the PIRT at this meeting were:

- Approval of the revised PIRT Terms of Reference
 - Approval of the schedule for updating the CSLF Technology Roadmap
 - Approval of a plan for analyzing CSLF-recognized projects in relation to technology gaps
 - Approval of a proposal for engaging CSLF-recognized projects and attracting new projects, including a CSLF Projects Workshop that would be held some time in the future
 - **Approval of a revised CSLF Project Submission Form**
 - Approval of a recommendation that the CSLF Charter be extended beyond its expiry date of 2013
 - Development of ideas for enhanced collaboration with the IEA GHG and GCCSI, including proposals for new IEA GHG projects
- All of the PIRT's actions were brought forward to the full Technical Group for its consideration.

2. EXAMINATION OF THE *CSLF GAPS ANALYSIS CHECKLIST*

2.1 Minutes of the Technical Group Meeting

Warsaw, Poland

Thursday, 07 October 2010

<http://www.csforum.org/publications/documents/Warsaw2010/tgMinutesWarsaw1010Final.pdf>

11. Update of CSLF Project Submission Form

Chairman Riis stated that this item had been mostly handled during the previous item, as there had been consensus that the four Working Groups should develop condensed and concise lists of gaps for a revision to the Gaps Analysis Checklist in time for the next PIRT meeting. After ensuing discussion there was agreement to keep the existing Project Submission Form / Gaps Analysis Checklist for now, while the new Task Force to Assess Progress on Technical Issues Affecting CCS and the PIRT work to develop a revision to the

Form and Checklist, as described earlier. Harry Schreurs proposed that two Checklists are actually needed – the concise Checklist for the Project Submission Form and a “deeper level of granularity” Checklist that can be used to evaluate projects. **There was consensus to adopt this approach, and the four Working Group Chairs were empowered to shorten the existing Checklists as needed to produce the concise versions.**

2.2 Edmonton May 2011

<http://www.csforum.org/publications/documents/Edmonton2011/Foster-TG-PIRTReport-Edmonton0511.pdf>

PIRT Meeting Edmonton, May 18, 2011

OUTCOMES (1)

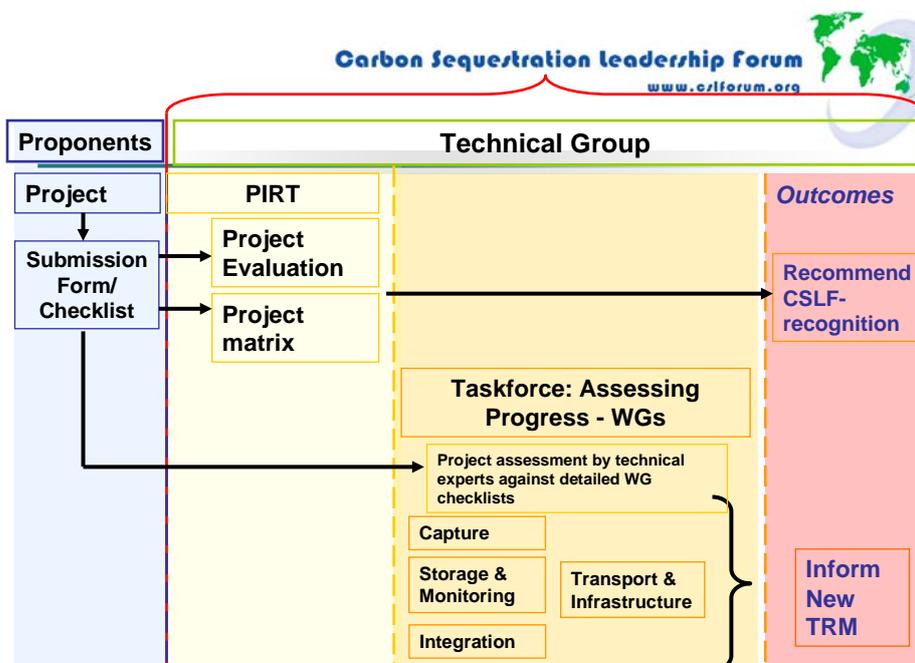
Procedural matters

- Agreed to remove *Taskforce to Assess Progress on Technical Issues affecting CCS* from PIRT – report to TG
- **Will re-examine CSLF Gaps Analysis Checklist as used for Project Submission. Aim to simplify.**
- Discussed technical presentations to the PIRT for CSLF project recognition – reaffirming the PIRT role in recommending projects to the TG

2.3.1 Presentation to the PIRT, Beijing 19 September 2012

<http://www.csforum.org/publications/documents/beijing2011/Bachu-ChairmanPresentationPIRT-Beijing0911.pdf>

See PowerPoints 4-11



Roles in CSLF Project Recognition and technology input to TRM

2.3.2 Minutes of the Technical Group Meeting Beijing, China Tuesday & Wednesday, 20-21 September 2011

http://www.cslforum.org/publications/documents/beijing2011/tg_MinutesBeijing0911Final.pdf

8. Report from Projects Interaction and Review Team (PIRT)

The Acting PIRT Chair, Stefan Bachu, gave a presentation that summarized the PIRT's recent accomplishments. At the Edmonton meeting, the PIRT reached an agreement that the Task Force on Assessing Progress on Technical Issues Affecting CCS should be separated from the PIRT, and report directly to the Technical Group. Also at the Edmonton meeting, the PIRT approved two projects for CSLF recognition: the Jänschwalde Project and the Zero Emission Porto Tolle (ZEPT) Project. The PIRT also discussed the need to simplify the CSLF Project Submission Form and Gaps Analysis Checklist.

At the previous day's PIRT meeting, the four projects that were just approved by the Technical Group were initially reviewed and approved by the PIRT. After approval by the Technical Group, the projects then go for review by the Policy Group. **A discussion regarding the level of detail on the CSLF Project Submission Form also occurred. While some argued that the forum should be simpler, there were other arguments to keep it as detailed as possible, particularly if there is a need to uncover what the projects will do and what gaps in knowledge will be address. There was no resolution to the issue, and thus it will be brought up again during the next PIRT meeting.**

2.4 Bergen June 2012 see Power Points 1-7 only

<http://www.cslforum.org/publications/documents/bergen2012/Foster-UpdateProjectSubmissionForm-PIRT-Bergen0612.pdf>

Summary of Responses Received from PIRT Delegates to Proposed Simplified Gaps Analysis Checklist

CSLF Member	Adopt Simplified Checklist?	Comments
Australia • Aldous	Yes	
Canada • Bachu	Yes	
Denmark • Frederiksen	Yes	
European Commission • Peteves • Schuppers	Yes Yes	Modify the wording of the 4 th “Storage complex characterisation” category to: “Effects of CO ₂ -rock/water interactions and induced changes in temperature, pressure and stress on permeability, injectivity, migration, trapping and capacity”.
France • Bonijoly	Yes	
Italy • Girardi • Persoglia	Yes Yes	
Japan • Tanaka	Yes	
Mexico • González-Santaló	Yes	
Netherlands • Ramsak	Yes	
Norway • Riis	Yes	
Poland • Wróblewska	Yes	
Saudi Arabia • Abuleif	Yes	
South Africa • Surridge	Yes	
United Kingdom • Sharman	Yes	Add an additional category for “Depleted Oil/Gas Fields”; reposition the “Transport” section before the “Storage” section.
United States • Bromhal • Mollot	Yes Yes	

- 1 [Alberta Enhanced Coal-Bed Methane Recovery Project \(Project Completed\)](#)
- 2 [CANMET Energy Technology Centre \(CETC\) R&D Oxyfuel Combustion for CO2 Capture](#)
- 3 [CASTOR \(Project Completed\)](#)
- 4 [CCS Belchatów Project](#)
- 5 [CCS Rotterdam](#)
- 6 [CGS Europe Project](#)
- 7 [China Coalbed Methane Technology/CO2 Sequestration Project \(Project Completed\)](#)
- 8 [CO2 Capture Project - Phase 2 \(Project Completed\)](#)
- 9 [CO2 Capture Project - Phase 3](#)
- 10 [CO2CRC Otway Project](#)
- 11 [CO2 Field Lab Project](#)
- 12 [CO2 GeoNet](#)
- 13 [CO2 Separation from Pressurized Gas Stream](#)
- 14 [CO2STORE \(Project Completed\)](#)
- 15 [CO2 Technology Centre Mongstad Project \(formerly European CO2 Technology Centre Mo\)](#)
- 16 [Demonstration of an Oxyfuel Combustion System](#)
- 17 [Dynamis \(Project Completed\)](#)
- 18 [ENCAP \(Project Completed\)](#)
- 19 [Fort Nelson Carbon Capture and Storage Project](#)
- 20 [Frio Project \(Project Completed\)](#)
- 21 [Geologic CO2 Storage Assurance at In Salah, Algeria](#)
- 22 [Gorgon CO2 Injection Project](#)
- 23 [IEA GHG Weyburn-Midale CO2 Monitoring and Storage Project](#)
- 24 [ITC CO2 Capture with Chemical Solvents](#)
- 25 [Ketzin Test Site Project \(formerly CO2 SINK\) \(Project Completed\)](#)
- 26 [Lacq CO2 Capture and Storage Project](#)
- 27 [Quest CCS Project](#)
- 28 [Regional Carbon Sequestration Partnerships](#)
- 29 [Regional Opportunities for CO2 Capture and Storage in China \(Project Completed\)](#)
- 30 [Rotterdam Opslag en Afvang Demonstratieproject \(ROAD\)](#)
- 31 [SaskPower Integrated CCS Demonstration Project at Boundary Dam Unit 3](#)
- 32 [SECARB Early Test at Cranfield Project](#)
- 33 [Zama Acid Gas EOR, CO2 Sequestration, and Monitoring Project](#)
- 34 [Zero Emission Porto Tolle Project \(ZEPT\)](#)