Carbon Sequestration leadership forum
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TECHNICAL GROUP

Revisions to CSLF Project Submission Form

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REVISIONS TO CSLF PROJECT SUBMISSION FORM

Note by the Secretariat

Background

The CSLF Technical Group, at its 14-15 November 2006 meeting in London, United Kingdom, approved a new Project Submission Form that changed the type and amount of information requested from projects being proposed for recognition by the CSLF. This Form was subsequently revised at the CSLF meeting in Cape Town, South Africa, to incorporate additional choices in the "Project Elements" section. At the CSLF Ministerial Meeting in London on 13 October 2009, the Technical Group requested that the CSLF Projects Interaction and Review Team (PIRT) review the entire Form and recommend updates. The PIRT, at its February 2010 meeting in Canberra, Australia, did a complete review of the Form. This paper presents a summary of recommended revisions and the draft revised CSLF Project Submission Form.

Action Requested

The Technical Group is requested to approve the draft revised CSLF Project Submission Form.

Revisions to CSLF Project Submission Form

Project Title
No changes were recommended.

Project Location
No changes were recommended.

Project Goal
No changes were recommended.

Project Objectives
The following changes were recommended:

- Change title to "Project Objectives and Anticipated Outcomes"
- Project representatives will be asked to indicate key anticipated outcomes of the project.
- Project representatives will be asked to indicate what the project does to facilitate CCS deployment.

Project Description (non-technical)
The following changes were recommended:

- Change title to "Project Description and Relevance (non-technical)"
- Project representatives will be asked for an easily understandable description of the associated technology. (We are already requesting easily understandable descriptions of associated science and goals.)
- Project representatives will be asked to indicate areas of industrial application and relevance.

Project Description (technical)
The following change was recommended:

- Eliminate the request for an estimation of the greenhouse gas mitigation impact of the project.

Project Elements
No changes were recommended.

Project Timeline
The following change was recommended:

- Eliminate the query if the project will be able to meet its major milestones prior to the expiration of the CSLF Charter (currently in 2013).

Information Availability
No changes were recommended.

Dissimilarity to Other CSLF Projects
The following change was recommended:

- Eliminate this entire section. We will no longer ask project representatives for a short description of how the proposed project is non-duplicative of other CSLF-recognized projects.

Relevance to CSLF Gaps Analysis
The following change was recommended:

- Instead of asking project representatives to describe what aspects of the CSLF Gaps Analysis are likely to be addressed by the project outcomes, a checklist of gaps will be provided for project representatives to select the gaps that will be addressed.

Project Contacts
The following change was recommended:

- Eliminate the reference to "representatives of CSLF Members" regarding site visits. Site visits should not be restricted to only representatives of CSLF Members.

Other Project Team Members
The following changes were recommended:

- Change title to "Other Project Participants"
- We will no longer ask for points of contact for all entities who are participating in the project. We are now only requesting contact information for the project contacts shown in the previous section.

Project Websites
No changes were recommended.

Project Nominators
The follow changes were recommended:

- We will no longer ask for two Project Representatives to sign the Project Submission Form. One is sufficient.
- At least two CSLF Members nominating the project must sign the Project Submission Form. (This clarifies that more than two CSLF Members can nominate a project.)
- The designation "Project Sponsors" will be changed to "Project Representatives". (Note: This change takes effect throughout the Form.)

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 ELEMENTS:
Please check all that apply.
Pre-combustion CO_2 Capture ____
Post-combustion CO_2 Capture ____
Oxyfuel Combustion ____
CO_2 Capture by Other Means (please describe):
CO_2 Transport ____
CO_2 Storage with Enhanced Oil Recovery ____
CO_2 Storage with Enhanced Coal Bed Methane Recovery ____
CO_2 Storage with Enhanced Natural Gas Recovery ____
CO_2 Storage with No Resource Recovery ____
CO_2 Measurement, Monitoring, and Verification of Storage (MMV) ____
Identification of Potential CO_2 Storage Sites ____
Identification of Target CO_2 Sources ____
Economic Evaluation ____
Environmental Evaluation ____
Risk Assessment (HSE) ____
Risk Assessment (Financial) ____
Other (please describe):

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? _____

INFORMATION AVAILABILITY:

Please provide a description of the types of information that will made available from the project and the outcomes that would be achieved by the project. Please also provide information about the relevance of the project to the overall aims of the CSLF and to carbon capture and storage technology in general.

Please also provide answers to the following questions:

Is the project management willing to share non-proprietary project information with other CSLF Members? _____

Will the expected information from the project be sufficient to allow others to make informed estimates of the technology's potential technical performance, costs, and benefits for any future applications? _____

Will English-language project summaries be available for posting at the CSLF website? _____
(Please also provide details on how, and how often, these summaries and other project information will be made available.)

RELEVANCE TO CSLF GAPS ANALYSIS:

Please check items that apply in the Attachment.

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.

_____
Project Representative
(Affiliation)

_____
CSLF Delegate
(CSLF Member)

_____
CSLF Delegate
(CSLF Member)

CSLF Gaps Analysis Checklist

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

CAPTURE TECHNOLOGIES

Post-Combustion Capture	
Optimise capture systems	
Improved solvent systems	
Power plant concepts to integrate CO_2 capture	
CO_2 capture pilot plant	
Fully integrated demonstration plant	
Develop better solvents	
Optimise capture process systems to reduce power stations energy loss and environmental impact	
Advance organic / inorganic non-precipitation absorption systems	
Identify advantages and limitations of precipitating systems (e.g., carbonates)	
Develop better understanding of the assessment of environmental impacts of capture technologies	
Pre-Combustion Capture	
Hydrogen-rich turbines	
Improved air separation processes	
Improved water-gas shift	
Improved H_2/CO_2 separation	
Power plant concepts to integrate CO_2 capture	
Polygeneration optimization	
Advance integration and optimization of components for power station applications	
Coal and liquid petroleum gasification, natural gas reformer, syngas cooler	
Improve CO_2 separation and capture technologies	
Develop high efficiency and low emission H2 gas turbines	
Fully integrated demonstration plant	
Oxyfuel Combustion	
Boiler design	
Improved air separation processes	
Oxy-fuel gas turbines	
Combustion science	
Power plant concepts to integrate CO_2 capture	
CO_2 capture pilot plant	
Fully integrated demonstration plant	
High temperature turbines	
CO_2/N_2 seperation technology for industrial processes	
Research into material selections	
Cryogenic air seperation	

CSLF Gaps Analysis Checklist

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

CAPTURE TECHNOLOGIES

Industrial Applications	
Capture from non-power industrial processes	
Emerging and new concepts for CO_2 capture	
Research into Post-combustion carbonate looping cycles	
Research into Gas separation membranes and adsorption processes for CO_2	
Research into Ion-transport membranes for O_2 separation	
Research into Chemical looping	
Generation Efficiency	
Support initiatives to improve efficiency of electricity generation plant	
Develop high efficiency gas turbines and support new cycle concepts	
Develop alternative power generation processes that have the potential to produce improved economics when paired with absorption capture	

CSLF Gaps Analysis Checklist

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

STORAGE TECHNOLOGIES

Injection	
Optimum well spacings and patterns	
Optimum injection parameters	
Definition of variable rock facies or rock property types for injectivity.	
Sustainability of high injection rates	
Formation water compression / displacement in closed or open system	
Reservoir engineering aspects	
Address costs associated with storage, especially drilling and establishing wells	
Storage Options	
Saline Aquifers – fluids/rock relationships and interactions	
Coal – rock properties	
EOR – lessons to be applied to other storage reservoirs	
Depleted oil and gas fields – viability	
Basalts – proof of concept	
Ultra-low permeability rocks (e.g., organic rich shales, non-conventional reservoirs) – proof of concept	
A world-wide digital CO_2 storage atlas	
Deep Saline Formations	
Consistent methodology for storage capacity estimation	
Record and define existing aquifer capacity data from world-wide projects	
Provides a robust storage capacity classification system and informs the legal end of storage licensing procedures	
Reservoir and cap rock characteristics – storage injectivity, capacity and integrity	
Predicting spatial reservoir and cap rock characteristics with uncertainties	
Depleted Oil and Gas Fields	
Depleted oil and gas fields – existing wells and remediation	
Inventory of oil and gas fields with large storage capacity	
Unmineable Coal Seams	
Worldwide storage capacity in unmineable coal seams	
CO_2-coal interactions – methane displacement and permeability decreases	
Mineral Carbonation	
Enhancing mineral trapping in specific types of settings (basalt, saline aquifers, etc.)	
Impact on fluid flow, injectivity, and geomechanics	
Thermodynamics and kinetics of chemical and microbiological reactions	
Techno-economic viability of mineral storage of CO_2	
Gaps in Uses of CO_2 (EOR and EGR)	
Validate enhanced recovery of gas (EGR) (including ECBM)	

CSLF Gaps Analysis Checklist

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

STORAGE TECHNOLOGIES

Trapping	
Understanding physical or chemical trapping mechanisms	
Migration rate	
Hydrodynamics	
Petroleum field development impact on hydrodynamic regime	
Research the impact of the quality of CO_2 (purity of CO_2) on interactions with the formation, brine, and storage behaviour	
CO_2 Properties	
Behaviour of CO_2 under different regimes of pressure, temperature and fluid mixtures	
Assessments	
Storage Capacity assessment methodologies or standards	
Country wide or regional assessments of storage potential	
Innovative methods for assessments of geological storage potential	
Geological site characterisation, methodologies, techniques and standards	
Protocols for evaluation of potential sterilisation of existing resources	
Develop appropriate models to predict the fate and effects of the injected CO_2 (multi-phase fluid flow, thermo-mechanical-chemical effects and feedback), including leakage	
Leakage	
Flux rates of modern and ancient systems	
Quantification and modelling of potential subsurface leakage impacts	
Existing facilities and materials	
Economics	
Costs of storage	
Software	
Parameters for modelling fluid and rock interactions	
Improvements in software for basin wide geological, reservoir engineering and hydrodynamic model	
Integration in single software system of geological, reservoir engineering and hydrodynamic aspects	
Risk	
Risk assessment models	
Public Outreach	
Procedures and approaches for communicating the impacts of geological storage to the general public	

CSLF Gaps Analysis Checklist

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

MONITORING

General	
Assess long-term site security post-injection including verified mathematical models of storage	
Define methods for the production and disposal of brine from saline formations as a result of CO_2 injection	
Wellbore Integrity	
Functionality and resolution of available logging tools	
Improved interpretation of cased hole logs	
Improved wellbore monitoring techniques	
Physical or chemical changes to cement	
Identification of Faults and Fractures	
Use of seismic techniques	
Use of non-seismic geophysical techniques	
Improved recognition and interpretation of the nature of faults and fractures	
Subsurface Leaks	
Sesimic, resolution	
Seismic, cost reduction	
Evaluation of permanent or semi-permanent sampling points in an observation well	
Surface and Near-Surface Leaks	
Detecting CO_2 seeps into subaqueous settings	
Remote sensing of CO_2 flux	
Use of vegetational changes by hyperspectral surveys changes to identify gas levels in the vadose zone	
Improved remote sensing to identify souces of CO_2	
Compile baseline surveys for measurement, monitoring and verification (MMV) activities including site-specific information on CO_2 background concentration and seismic activity	
Develop instruments capable of measuring CO_2 levels close to background and to distinguish between CO_2 from natural processes and that from storage	
Monitor impacts (if any) on the environment	
Guideline Development	
Determination of effective pre-injection surveys	
Improved integration of monitoring techniques	
Identify thresholds of leakage that can be measured	
Develop best practice guidelines selection, operation and closure, including risk assessment and response and remediation plans in case of leakage	

CSLF Gaps Analysis Checklist

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

MONITORING

Gaps in Security of Geologic Storage	
Model the fate and effects of injected or leaked CO_2	
Develop best practice guidelines on how to characterize and monitor a site prior to, during, and after storage	
Build tools that can be used to characterise a potential storage site	
Develop low cost and sensitive CO_2 monitoring technologies	
Construct maximum impact procedures and guidelines for dealing with CO_2 leaks	
Create risk assessment tools to identify the likelihood and consequence of CO_2 leaks and inform effective decision making	

CSLF Gaps Analysis Checklist

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

TRANSPORT

General	
Cost benefit analysis and modelling of CO_2 pipeline and transport systems	
Tanker transport of liquid CO_2	
Specifications for impurities from various processes	
Dispersion modelling and safety analysis for incidental release of large quantities of CO_2	
Safety and mitigation of pipelines through urban areas	
Safety protocols to protect CO_2 pipelines, including response and remediation	
Identify regulations and standards for CO2 transport	
Integration	
Identify reliable sources of information and data related to the design, cost, and space requirements, operation, and integration of CCS with energy facilities	
Conduct periodic technical reviews of all aspects of recognized large-scale CCS demonstration projects and report on the "lessons learned"	
On a periodic basis, update the Technology Roadmap to include technology gaps identified during the technical assessment of demonstration projects	
Integrate with existing infrastructure	
Cross-Cutting Issues	
Energy price issues would encourage the take-up of CCS	