



IEAGHG Update to CSLF

Tim Dixon
IEA GHG R&D Programme
CSLF Technical Group, 28 October 2014

IEA Greenhouse Gas R&D Programme (IEAGHG)



- “ A collaborative international research programme founded in 1991
- “ Aim: To provide information on the role that technology can play in reducing greenhouse gas emissions from use of fossil fuels.
- “ Focus is on Carbon Dioxide Capture and Storage (CCS)
- “ Producing information that is:
 - Objective, trustworthy, independent
 - Policy relevant but NOT policy prescriptive
 - Reviewed by external Expert Reviewers



IEAGHG



- “ Flagship activities:
- “ Technical Studies >250 reports published on all aspects of CCS
- “ International Research Networks
 - “ Risk Assessment
 - “ Wellbore Integrity
 - “ Monitoring
 - “ Modelling
 - “ Environmental Impacts
 - “ Oxy-combustion
 - “ Post-combustion Capture
 - “ Solid Looping Capture
 - “ Social Research
- “ GHGT conferences . GHGT-12 in Austin USA, 5-9 Oct 2014



IEAGHG



- “ Other activities include:
- “ Facilitating R&D and demonstration activities eg IEAGHG Weyburn-Midale CO2 Monitoring and Storage Project . **Best Practices for Validating CO2 Geological Storage** published Nov 2012
- “ International CCS Summer Schools - 2012 Beijing, 2013 UK, 2014 University of Texas Austin, USA
- “ Peer reviews, eg US DOE, US EPA; CO2CRC
- “ Active in international regulatory developments . **London Convention, UNFCCC, ISO TC265**
- “ Collaborations with IEA, GCCSI, CSLF, CCSA, EU ZEP and others



Update on CSLF and IEAGHG Collaboration

Arrangement between CSLF Technical Group and IEAGHG



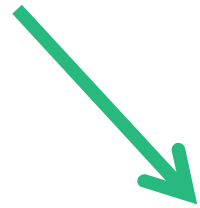
- “ How CSLF TG/PIRT and IEAGHG will interact for mutual benefit through increased co-operation
 - “ Mutual representation of each at CSLF TG and IEAGHG ExCo (no voting)
 - “ Liaison with PIRT co-chairs to discuss potential activities or projects . two way process
 - “ Activities would require approval by ExCo or TG
 - “ Due reference to org providing the resource
- “ Agreed by IEAGHG ExCo Oct 2007 and CSLF Technical Group Jan 2008



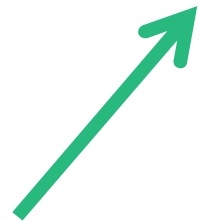


IEA GHG – Study generation

IEAGHG ExCo members



IEA GHG



CSLF TG

Proposal
Outlines



ExCo
Member
Voting

Proposals



ExCo



Studies
and
Reports





CSLF-proposed studies

- “ Development of Storage Coefficients for CO₂ Storage in Deep Saline Formationsq IEAGHG Report 2009/13. Presentation at CSLF TG Mar 2010
- “ Geological Storage of CO₂ in Basaltsq IEAGHG Report 2011/TR2. Presentation at CSLF TG Sep 2011
- “ Potential Implications of Gas Production from Shales and Coal for CO₂ Geological Storage. ARI. Report published 2013. IEAGHG Report 2013/10. Presentation at CSLF TG Nov 2013
- “ **Life cycle assessment (LCA) of CCUS – Benchmarking.** Proposed at 46th ExCo . will be a workshop with report
- “ Additional new study ideas invited from CSLF TG/PIRT
- “ Outline required by 22 January 2015



Update on IEAGHG activities

Reports published



| | Contractor | Report number | Publication date |
|--|----------------------|---------------|------------------|
| CO ₂ Pipeline Infrastructure | Ecofys (GCCSI) | 2013-18 | 14/01/2014 |
| Deployment of CCS in the Cement Industry | ECRA (GCCSI) | 2013-19 | 13/02/2014 |
| Comparing Different Approaches to Managing CO ₂ Storage Resources in Mature CCS Futures | BGS (GCCSI) | 2014-01 | 19/03/2014 |
| Evaluation of Reclaimer Sludge Disposal from CO ₂ PCC Process | Trimeric Corporation | 2014-02 | 24/03/2014 |
| (Costs of) CO ₂ Capture at Coal-Based Power Plants | Foster Wheeler | 2014-03 | 03/07/2014 |
| Evaluation and analysis of the performance of dehydration units for CO ₂ capture | AMEC | 2014-04 | 14/04/2014 |
| Biomass and CCS - Guidance for accounting for negative emissions | Carbon Counts | 2014-05 | 03/07/2014 |
| 5th HTSLCN Meeting Cambridge | IEAGHG | 2014-06 | 09/07/2014 |
| Iron and Steel Workshop Tokyo | IEAGHG | 2014-07 | 19/08/2014 |

Studies being reported



| | Contractor | Publication date |
|--|----------------------------------|------------------|
| CO ₂ Storage Efficiency in Aquifers | EERC | April 2014 |
| Post Combustion Capture Process Flow Sheet Modifications | Hamburg University of Technology | April 2014 |
| Geomechanical Fault Stability | NGI | May 2014 |



Studies underway



| Title | Contractor | Draft Report date |
|--|----------------------|-------------------|
| Monitoring Selection Tool | BGS | December 2014 |
| Impact of CO ₂ Impurity on CO ₂ Compression and Transportation | Newcastle University | July 2014 |
| Oxy Gas Turbine Power Plants | Foster Wheeler | September 2014 |
| Cost components for storage of CO ₂ in association with enhanced oil recovery | TNO | September 2014 |
| Quantifying and monitoring emissions reductions from CO ₂ -EOR | Carbon Counts | September 2014 |
| Review of Offshore Monitoring Techniques | BGS | September 2014 |
| Evaluation of CO ₂ Adsorption Process in Natural Gas Production | SINTEF | February 2015 |
| Evaluation of Various Process Control Strategy for Normal and Flexible Operation of PCC | Imperial College | January 2015 |

Studies in tender



| Title | Proposal number |
|---|-----------------|
| Understanding the Cost of Retrofitting CO ₂ Capture in Oil Refineries (consortium formed, co-funding under negotiation, expected start date summer 2014) | 42-07 |
| Techno-economic evaluation of CO ₂ capture for Pulp and Paper (under negotiation, expected start date summer 2014) | 43-10 |
| Value of Flexibility in CCS Power Plants | 44-04 |
| Production of Hydrogen with CO ₂ Capture | 44-01 |



Studies awaiting start - 1



| Title | Proposal number |
|--|-----------------|
| Energy Storage and CCS | 43-02 |
| <i>Evaluation of Various Process Control Strategy for Normal and Flexible Operation of PCC [pending PS return]</i> | 43-03 |
| <i>Design and Costs of Full Scale Solid Looping CO₂ Capture Plants [deferred to after CLC conference in September 2014]</i> | 44-03 |
| <i>What Have We Learnt from Large Scale Operational Projects - Storage Study [deferred to follow IJGGC special issue]</i> | 44-11 |
| <i>What Have We Learnt from Large Scale Operational Projects - Capture Study [deferred to follow IJGGC special issue]</i> | 44-11 |
| Criteria for Depleted Oil and Gas Fields to be Considered for CO ₂ Storage | 45-07 |
| Fault Permeability | 45-06 |
| Regional Variation of Capture Costs | 45-01 |



Studies awaiting start - 2



| Title | Proposal number |
|--|-----------------|
| Life Cycle Assessment (LCA) of CCUS – Benchmarking (CSLF) | 46-10 |
| Reducing CO ₂ Emissions from the Natural Gas Supply Chain | 46-02 |
| Application and Advances in Monitoring at Different CO ₂ Storage Sites | 46-08 |
| Geochemical Effects of Impurities in the CO ₂ Stream on Formation Rocks and Well Cements under In-situ Conditions | 46-09 |
| Techno Economic Evaluation of CO ₂ Capture in Liquefied Natural Gas Process | 46-03 |



Research Networks etc

2014/15 meetings



- “ IEAGHG Networks session at IEA Regulatory Network Meeting, Paris, 27-28 May 2014 *Emerging findings from research which may impact regulation*
- “ Combined meeting of **Monitoring Network** and **Modelling Network**. Hosted by West Virginia University, Morgantown, WV, 5-8 August 2014
- “ Combined meeting of **Risk Management Network** and **Environmental Research Network**. National Oceanography Centre, UK. 30 Sep 2015
- “ **High Temperature Solid Looping Network**. Milan, Italy. 1-3 Sep 2015
- “ **Monitoring Network**. LBNL, California. Date tbd June 2015
- “ **Social Research Network**. University of Cambridge and Tyndall Centre, UK. Date tbd July 2015
- “ Information on <http://www.ieaghg.org/index.php?/networks.html>
- “ **PCCC3**, Regina, Canada, 8-11 Sep 2015



Thank you

Any questions?