



**IEA Greenhouse Gas R&D Programme**

# **Update Report from IEAGHG**

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IEAGHG**

***CSLF Technical Group, Abu Dhabi  
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# Greenhouse Gas R&D TCP



Part of the IEA ETN since 1991



33 Members from 15 countries plus OPEC, EU and CIAB

What We Are:



Members set strategic direction and technical programme



Independent Technical Organisation

- We don't define policy
- We are not advocates

# 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*** >300 reports published on all aspects of CCS
- ***International Research Networks***
  - Risk Assessment/Management
  - Monitoring
  - Modelling
  - Environmental Research
  - Social Research
  - Oxy-combustion
  - Solid Looping
- ***GHGT conferences***
- ***PCC conferences***

# IEAGHG



- Other activities include:
- International CCS Summer Schools: 2017 – July, Regina, Canada
- Peer reviews, eg US DOE, US EPA; CO2CRC
- Active in international regulatory developments – UNFCCC, London Convention, ISO TC265
- Collaborations with IEA, CSLF, CCSA, EU ZEP and others



ieaghg





# Update on CSLF and IEAGHG Collaboration



# Arrangement between CSLF Technical Group and IEAGHG



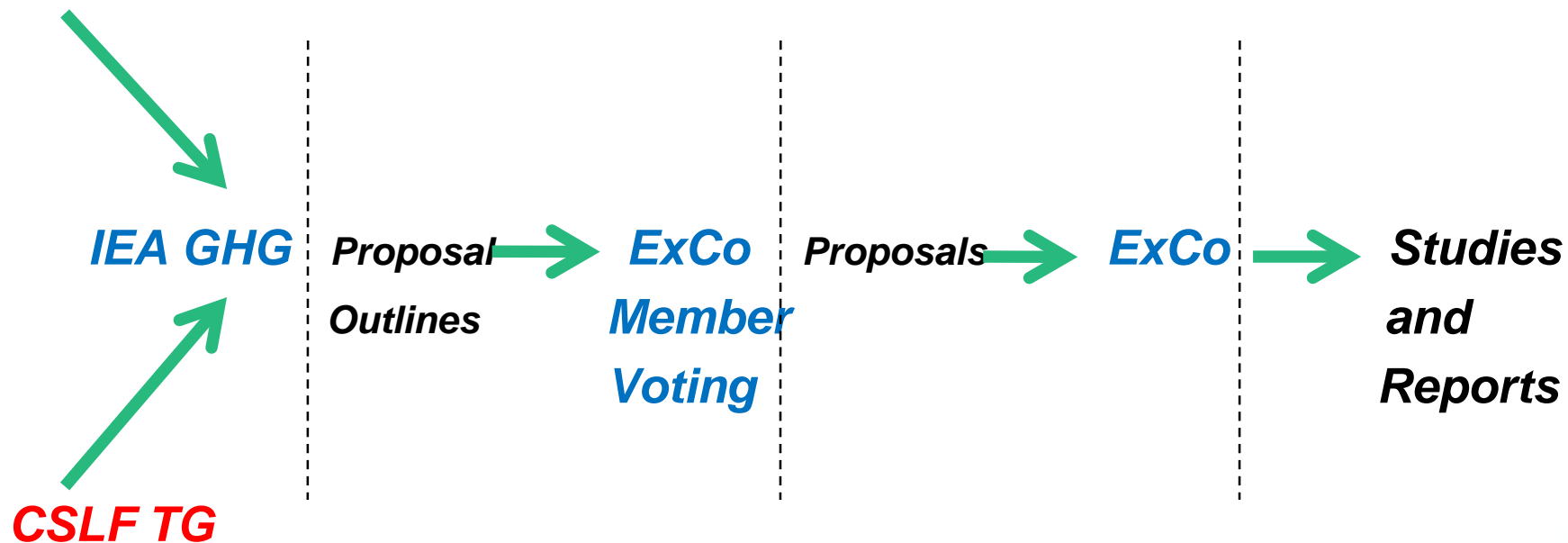
- ***How CSLF TG/PIRT and IEAGHG will interact for mutual benefit through increased co-operation***
  - Mutual representation of each at CSLF TG and IEAGHG ExCo (no voting)
  - Liaison with PIRT co-chairs to discuss potential activities or projects – two way process
  - Activities would require approval 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*





# CSLF-proposed studies

- ‘Development of Storage Coefficients for CO<sub>2</sub> Storage in Deep Saline Formations’. IEAGHG Report 2009/13. Presentation at CSLF TG Mar 2010
- ‘Geological Storage of CO<sub>2</sub> in Basalts’, IEAGHG Report 2011/TR2. Presentation at CSLF TG Sep 2011
- Potential Implications of Gas Production from Shales and Coal for CO<sub>2</sub> Geological Storage. ARI. Report published 2013. IEAGHG Report 2013/10. Presentation at CSLF TG Nov 2013
- ‘LCA of CCUS – Benchmarking’. Proposed to 46<sup>th</sup> ExCo. Developed as round-table/workshop: 11-12 Nov 2015 London. CSLF on Steering Committee. Report “Workshop on LCA in CCUS”, IEAGHG 2016/03, March 2016. Presented to CSLF TG June 2016.
- International Workshop on Offshore Geological CO<sub>2</sub> Storage, 2016-TR2, July 2016. Presented at CSLF TG June 2016
- Additional new study ideas invited from CSLF TG/PIRT
- **Outline required by July 2017**

# Reports published (1)



	Contractor	Report number	Publication date
Performance and Cost of Retrofitting CCS in the Pulp and Paper Industry (reference papers)	VTT / ÅF Engineering / IEAGHG	2016-TR5	July 2016
Regional Assessment of Economic Barriers to CO2-EOR	TNO	2016-11	October 2016
Emissions Accounting for CO2-EOR (Members Only)	Carbon Counts	2016-06	October 2016
National CO2 Storage Assessment Guidance	IEAGHG	2016-TR6	October 2016
Evaluation of Process Control Strategies for PCC	Imperial College London & PSE Ltd	2016-07	September 2016

# Reports published (2)



	Contractor	Report number	Publication date
Techno-Economic Evaluation of Retrofitting CCS in a Market Pulp Mill and an Integrated Pulp and Board Mill”	ÅF Consult Oy VTT	2016-10	22/02/2017
Case Studies of CO <sub>2</sub> Storage in Depleted Oil and Gas Fields	BGS and Gulf Coast Carbon Centre UT	2017-01	17/01/2017
Techno-Economic Evaluation of SMR Based Standalone (Merchant) Plant with CCS”,	AMEC Foster Wheeler and IEAGHG	2017-02	13/03/2017
Techno-Economic Evaluation of Hyco Plant Integrated to Ammonia / Urea or Methanol Production with CCS”	AMEC Foster Wheeler and IEAGHG	2017-03	13/03/2017
CO <sub>2</sub> capture in natural gas production by adsorption processes for CO <sub>2</sub> storage, EOR and EGR	Hyungwoong Ahn, Uni Edin, Gelein de Koeijer, Statoil	2017-04	17/03/2017

# Reports published (3)



	Contractor	Report number	Publication date
Combined Meeting of the IEAGHG Monitoring and Modelling Networks	IEAGHG - Meeting	2017-05	20/03/2017
Feasibility Study for Ship Based Transport of Ethane to Europe and Back Hauling of CO <sub>2</sub> to the USA	Michael Moore	2017-TR1	01/03/2017
Review of CO <sub>2</sub> Storage Basalts	IEAGHG - Review	2017-TR2	30/01/2017
Reference data and supporting literature Reviews for SMR Based Hydrogen Production with CCS	AMEC Foster Wheeler and IEAGHG	2017-TR3	14/03/2017

# Reports in progress to be published



Title	Contractor	Publication date
Value of Flexibility in CCS Power Plants	Imperial College (UK)	May 2017
Effect of Plant Location on Costs of Capture	AMEC (Italy)	June 2017
CO <sub>2</sub> Migration in the Overburden	BGS (UK)	July 2017
CO <sub>2</sub> Storage Efficiency – Stage 2	EERC (USA)	August 2017
Commercial and Economic Arrangements of Industry CCS Clusters	Element Energy (UK)	August 2017

# Studies underway



Title	Contractor	Draft Report date
Understanding the Cost of Retrofitting CO <sub>2</sub> Capture in Oil Refineries	Consortium led by SINTEF, co-funded by CLIMIT (Norway)	2017
CO2STCAP (Cutting Capture Costs in Process Industries)	Consortium led by Tel-Tek, funded by CLIMIT	2019
Techno-Economic Evaluation of CO <sub>2</sub> Capture in LNG Process	Costain	April 2017
CCS in Climate Change Mitigation Scenarios	University College Cork	August 2017



# Studies awaiting start



Title	Expected start	Proposal number
Further Assessment of Emerging CO <sub>2</sub> Capture Technologies and their Potential to Reduce Costs	Screening phase first. Estimate Q2 2017	48-03
Understanding the Cost of Reducing Water Usage in Coal and Gas Fired Power Plants with CCS	Phased, after data from Regional Variation in Capture Costs. Estimate Q2 2017	48-12
Refineries and Electricity Production	Q4 2016	48-04
Opportunities for CO <sub>2</sub> recycle and use	Q4 2016	48-11
Well Engineering and Interventions	Q1 2017	50-05
Addressing Residual Emissions from CCS	Q1 2017	50-01



# ghgt-13



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Confederation

Swiss Federal Office of Energy SFOE

## GHGT-13 Statistics



991 Delegates from 38 Countries



341 Oral Presentations



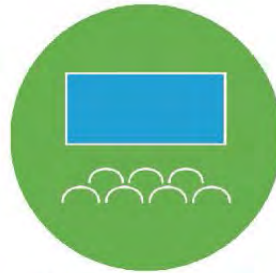
3 Keynote Speakers  
6 Technical Plenaries



12 Themes  
108 Sub-Themes



128 Reviewers



71 Technical Sessions



7 Panel Discussions



470 Posters



1043 Abstracts  
Received



16 Side Events



<http://www.ghgt.info/images/GHGT13/GHG-T-13%20Summary%20Brochure.pdf>

Papers will be on  
<http://www.sciencedirect.com/science/journal/18766102>

[www.ghgt.info](http://www.ghgt.info)

# CCS Activities at COP-22



- **Side event: “CCS Opportunities for Africa”.** 8<sup>th</sup> Nov (11:30-13:00). Official UNFCCC Side-event, Observer room 6.
- Main UNFCCC Side-event on CCS
- “CCS is a demonstrated technology to achieve deep GHG reductions. We report on progress towards CCS deployment in Africa and global CCS developments relevant for Africa, onshore and offshore. Steps for CCS pilot project development and new opportunities for technology transfer will be outlined”
- Collaboration with UT, CO2GeoNet, CCSA. Speakers from BHP/SaskPower, S.Africa, Nigeria, Ghana, UT BEG, CO2GeoNet, and IEAGHG (introducing and chairing).
- coverage : <http://www.iisd.ca/climate/cop22/enbots/8nov.html>
- and video is available at [https://www.youtube.com/watch?v=zapb3U2zU\\_8](https://www.youtube.com/watch?v=zapb3U2zU_8)



# CCS Activities at COP-22



- IEAGHG also presented at the following events:
  - 7 Nov. 1830-2000. CCS is necessary for meeting 2C. Venue: EU Pavilion, Blue Zone. Organiser CO2GeoNet. IEAGHG talk title: “CCS in achieving negative emissions”
  - 10 Nov. 0900-1030. CCS what its all about and why we need it. Venue: Green Zone (public). Organiser CO2GeoNet. IEAGHG talk title: “Why we need CCS”.
  - 10 Nov. 1530-1630. Climate readiness – Ocean based adaptation and mitigation. Venue: UK Pavilion, Green Zone. Organiser PML. IEAGHG talk title: “Large scale CCS - pros and cons for the oceans”.
- Booth on CCS information inside UNFCCC Blue area, with CO2GeoNet, UT, CCSA
- Much needed by COP participants



# IEAGHG events - 2017

- **Monitoring Network**, hosted by Battelle, Traverse City, Michigan, USA, 13-15 June.
- **High Temperature Solid Looping Network**, SWEREA MEFOS, Sweden, 4-5 September.
- **PCCC 4**. Hosted by NCCC, Birmingham, Alabama, USA, 5-8 September
- **Costs Network**. Imperial College, London, 13-14 September.

For more information and to register see <http://www.ieaghg.org>

Also with IEAGHG involvement:

- **2<sup>nd</sup> International Workshop on Offshore CCS**. GCCC UT, SANEDI and IEAGHG. Beaumont, Texas, 19-20 June. **CSLF supported** (follows recommendation in CSLF Offshore Task Force report, 2015) .

For more information and to register see <http://www.cvent.com/d/95q1d6>





# IEAGHG events - 2018

- **GHGT-14. 22-26 October 2018, Melbourne, Australia**
- [www.ghgt.info](http://www.ghgt.info)

# Webinar series



- Established June 2015
- 10 webinars to date
- **To be linked from CSLF website**

Webinar title	Date	Presenter	No. attendees	No. YouTube views to date
Impressions and discussion of COP22 Marrakech	08/12/2016	Arthur Lee	41	43
CCS in the Pulp and Paper Industry	25/01/17	Petteri Kangas/ Kristin Onarheim	55	153
The Economics of Deploying CCS in a SMR Standalone H2 Plant using NG as Feeds	16/02/17	Stanley Santos	89	113
1.5C Challenge	26/04/17	Jasmin Kemper		





International Energy Agency



Regular briefing on CCS status:  
**ROAD permit assessment;**  
**Offshore workshop**



Input to WPF/ETP and WEO



Input to:  
**5<sup>th</sup> Market Economics report**  
**Clean Energy and Hydrogen report**



IEAGHG  
Technical reports to CSLF  
Technical Group



ISO Technical Committee on CCS, TC-265  
4 draft standards, 2 technical reports – **IEAGHG input**



United Nations Framework Convention on Climate Change

CCS Side Events at COP20, COP21, **COP-22**