



IEA Greenhouse Gas R&D Programme

Update Report from IEAGHG

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CSLF Technical Group, Chatou, France

4 November 2019

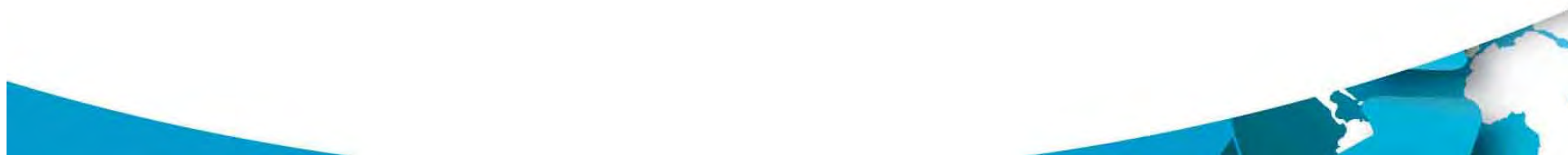


Who are we?

Our internationally recognised name is the IEA Greenhouse Gas R&D Programme (IEAGHG). We are a Technology Collaboration Programme (TCP) and are a part of the International Energy Agency's (IEA's) Energy Technology Network.

Disclaimer

The IEA Greenhouse Gas R&D Programme (IEAGHG) is organised under the auspices of the International Energy Agency (IEA) but is functionally and legally autonomous. Views, findings and publications of the IEA Greenhouse Gas R&D Programme do not necessarily represent the views or policies of the IEA Secretariat or its individual member countries.



Greenhouse Gas R&D TCP



Part of the IEA ETN since 1991



36 Members from 15 countries plus OPEC, EC 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 and biomass in power and industrial systems.
- 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** >330 reports published on all aspects of CCS
- **International Research Networks**
 - Risk Assessment/Management
 - Monitoring
 - Modelling
 - Environmental Research
 - High Temperature Solid Looping
 - Costs
- **GHGT conferences –**
- **GHGT-14, Melbourne, Australia, 22-26 Oct 2018**
- **PCCC conferences**
- **PCCC5, Kyoto, 17-20 Sep 2019**



IEAGHG



Other activities include:

- International CCS Summer Schools: 636 alumni, 58 countries
- 2019 – 8-12 July, International CCS Knowledge Centre, Regina
- 2020 – 12-18 July, Bandung, Indonesia



- Peer reviews, eg US DOE, US EPA; CO2CRC
- Collaborations with IEA, CSLF, CCSA, EU ZEP and many others



International Energy Agency



United Nations Framework Convention on Climate Change



CCS Side Events at COP20, COP21, COP-22, COP-23, **COP-24**

Input to WPF



IEAGHG
Technical reports to CSLF
Technical Group



Expert Reviewers, Accredited Observer



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



London Convention:
Regular updates on CCS:
ROAD permit assessment, Offshore workshops CO₂ Export

London Convention/Protocol



- Treaty for marine environmental protection
- LC41 and LP14 meeting at IMO London, 7th-11th October 2019

Ratification of the London Protocol's 2009 CO2 export amendment

- Needs two thirds of the now 50 Parties to the London Protocol to ratify for it to come into force (ie 33).
- Only Norway, UK, Netherlands, Iran, Finland and Estonia ratified to date (6)
- **Norway and Netherlands proposal to LP14 for “Provisional Application” of export amendment (joined by UK).** Drawing on IEA report 2011 (IEAGHG input)
- **IEAGHG supported with Information Paper 2019-IP11, and evidence-base in plenary with paper LC41/INF3**
- **Success! – Resolution for Provisional Application adopted 11 October 2019**

“RESOLUTION LP.X(Z) ON THE PROVISIONAL APPLICATION OF THE 2009 AMENDMENT TO ARTICLE 6 OF THE LONDON PROTOCOL”



Approved on 11 October 2019

2 pages of preamble then the operative clauses as follows:

- *1. DECIDES to allow for the provisional application of the 2009 amendment pending its entry into force by those Contracting Parties which have deposited a declaration on provisional application of the 2009 amendment;*
- *2. INVITES Contracting Parties to deposit with the Depositary a declaration on provisional application of the 2009 amendment of the London Protocol pending its entry into force;*
- *3. FURTHER RECALLS the obligation to notify the Depositary of agreements or arrangements mentioned in article 6, paragraph 2 of the London Protocol (as amended by resolution LP.3(4));*
- *4. AFFIRMS that the export of carbon dioxide under the provisional application of article 6 of the London Protocol (as amended by resolution LP.3(4)), and in compliance with the requirements of paragraph 2 of the article (as amended by resolution LP.3(4)) will not be in breach of article 6 as in force at the time of the export; and*
- *5. URGES Contracting Parties to consider accepting the amendment to article 6 of the London Protocol adopted through resolution LP.3(4).*

London Convention/Protocol



- This means that countries can now legally export and import CO₂ for offshore geological storage
- The guidance documents for permitting and for agreements which were revised/finalised for transboundary activities in 2012 (CO₂ Specific Guidelines) and 2013 (Agreements or Arrangements) should be used.
- Next meetings: Scientific Group March 2020, London.
LC42/LP15 October 2020, London



IEAGHG Members



ieaghg





Update on CSLF and IEAGHG Collaboration

Arrangement between CSLF Technical Group and IEAGHG

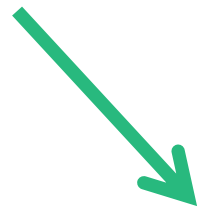


- ***How CSLF TG/PIRT and IEAGHG will interact for mutual benefit through increased co-operation***
 - Mutual representation of each at CSLF TG and IEAGHG ExCo (no voting)
 - Liaison with PIRT co-chairs to discuss potential activities or projects – two way process
 - Activities would require approval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

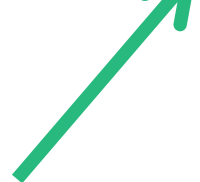


IEAGHG – Study generation

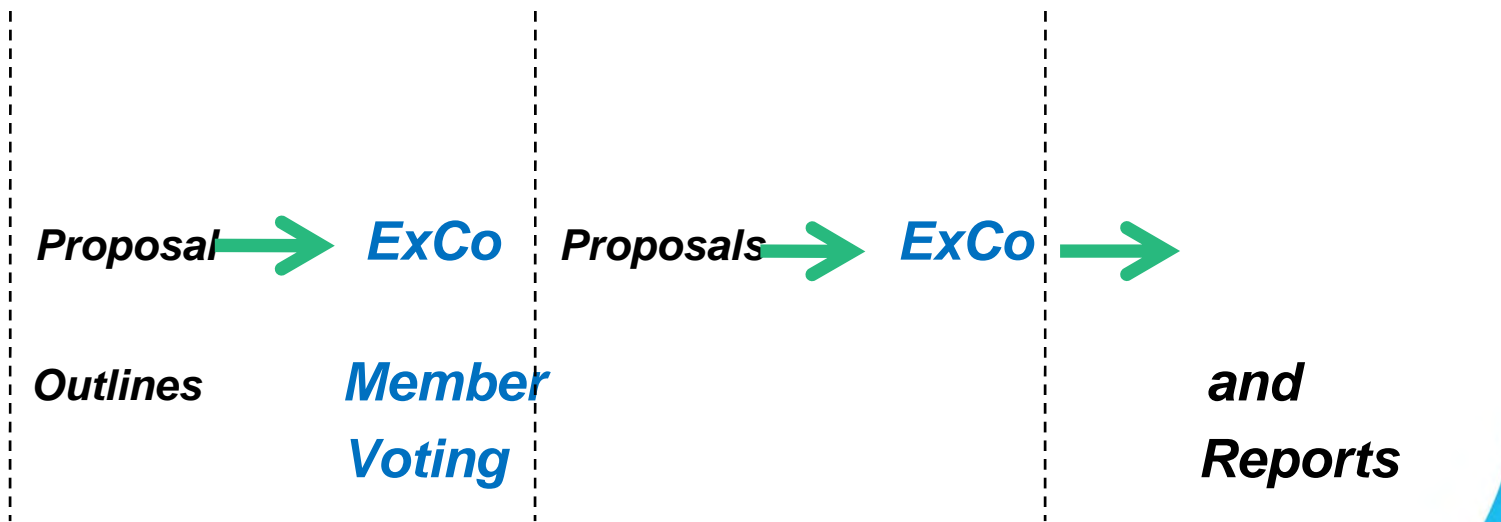
IEAGHG ExCo members



**IEA GHG
Studies**



CSLF TG





CSLF proposed/related studies

- 'Development of Storage Coefficients for CO₂ Storage in Deep Saline Formations'. IEAGHG Report 2009/13. Presentation at CSLF TG Mar 2010
- 'Geological Storage of CO₂ in Basalts', 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
- 'LCA of CCUS – Benchmarking'. 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 CO₂ Storage, 2016-TR2, July 2016. Presented at CSLF TG June 2016
- 2nd International Workshop on Offshore CCS. 2017/TR12. Nov 2017
- 3rd International Workshop on Offshore Geologic CO₂ Storage. 2018/TR02. Aug 2018

Additional new study ideas invited from CSLF TG

Outline required by 7 Jan 2020

Reports published (1)



	Contractor	Report number	Proposed by	Publication date
CCS in Energy and Climate Scenarios	UCC, ICL and UoOxford	2019-05	Shell	10/07/2019
Proceedings of 6 th CCS Cost Network	Edited by E S Rubin	2019-06		11/07/2019
Proceedings of workshop on representing CCUS in Energy Systems Models	University College Cork	2019-08		19/08/2019
Techno-Economic Evaluation of CO ₂ Capture in LNG Process	Costain	2019-07	IEAGHG	2/10/2019
Further assessment of emerging capture technologies and their potential to reduce costs	CSIRO	2019-09	IEAGHG	2/10/2019
The Shell Quest Carbon Capture and Storage Project	Carolyn Preston	2019-04	US DOE	01/11/2019
<i>Information Paper on CSLF Pore Space Utilisation Report</i>	CSLF	2019-IP12		26/09/2019

Reports in progress to be published - 1



Title	Contractor	Proposed by	Publication date
Costs of Reducing Water Usage	CSIRO	IEAGHG	March 2020



Reports in progress to be published - 2



Title	Contractor	Proposal number	Proposed by	Publication date
Refineries and Electricity Production	Wood plc	48-04	OPEC	December 2019
Beyond LCOE - Value of CCS in different generation and grid scenarios	Imperial College	51-04	UK	December 2019
Gas and coal-fired power plant with CO ₂ capture	Wood plc	51-03	Equinor	November 2019
Modelling and monitoring of CO ₂ storage: the potential for improving the cost-benefit ratio of reducing risk (Stage 1)	Battelle	52-09	Australia	November 2019

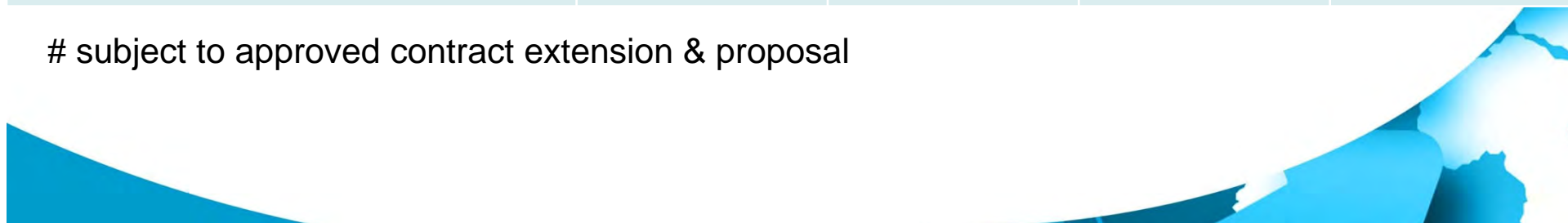


Studies underway (1)



Title	Contractor	Proposal number	Proposed by	Draft Report date
CCS and Sustainable Development Goals	TNO	53-14	Shell & IEAGHG	#
Addressing Challenges of the Powergrid with CCS	Element Energy	52-01	UK	September 2019
Value of Emerging and Enabling Technologies in Reducing the Costs, Risks and Timescales for CCS	Element Energy	52-12	UK	October 2019
Shipping Infrastructure	Element Energy	53-12	OPEC and EPRI	October 2019
Waste to Energy and CCS	Wood plc	53-04	NZ and IEAGHG	October 2019

subject to approved contract extension & proposal



Studies underway (2)



Title	Contractor	Proposal number	Proposed by	Draft date	Report
Techno-economic Potential of Biorefineries with CCS	VTT	52-06	IEAGHG	October 2019	
Review of Constructability and Operational Challenges faced by CCS Projects	Element Energy	55-01	IEAGHG	December 2019	

Studies out to tender



Title	Expected start	Proposal number	Proposed by
Induced Seismicity Review	November 2019	55-09	IEAGHG
CO ₂ Conversion Routes Reality Check	November 2019	55-12	Total



Studies awaiting start



Title	Expected start	Proposal number	Proposed by
Techno-economics of Near-term NETs	December 2019	55-15	IEA & France
Update on Cost of Capture in Refineries, Cement, Iron & Steel	January 2020	55-04	IEAGHG
CO ₂ as Alternative Feedstock: Identification of the most promising CO ₂ conversion pathways gathering environmental and economic benefits		56-07	France
Defining and Measuring the Value of CCS		56-14	IEAGHG
Achieving Deep Decarbonisation in Worldwide Fertiliser Production		56-05	UK
Criteria for depleted reservoirs to qualify for CO ₂ storage		56-10	IEAGHG
Prime solvent candidates for next generation of PCC plants.		56-03	IEAGHG

Research Networks and other events



2019

- Monitoring Network and Environment Network meeting, hosted by University of Calgary/CMC, 20th – 22nd August 2019.
- Fault workshop, hosted by University of Calgary, 23rd August 2019.
- PCCC5, hosted by RITE, Kyoto, 17th – 19th September 2019
- **Hydrogen and CCS workshop, with CSLF, hosted by EDF & ClubCO₂ in Paris, France 6th & 7th November 2019**

2020

- HTSL Network meeting, hosted by TNO in the Netherlands, January 2020 tbc.
- **4th Offshore CCS Workshop, hosted by STEMM-CCS, in Bergen, Norway, 11th – 12th February 2020. CSLF**



ghgt-15

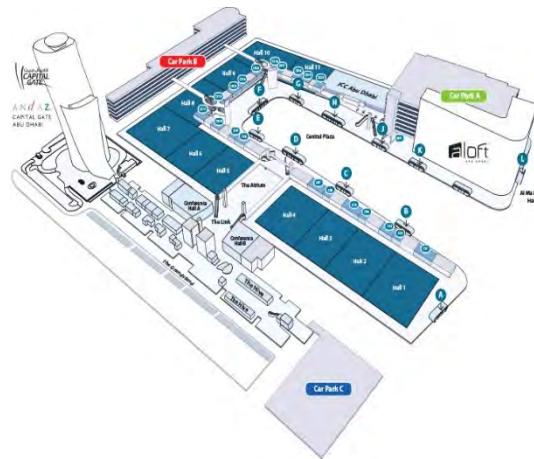
5th to 8th October 2020



Hosted by Khalifa University; Conference location - ADNEC,

Abu Dhabi, UAE

Call for abstracts opens 1st September 2019



- Deadline to submit an abstract – 7th January 2020
- Early Bird registration opens March 2020
- Draft Technical programme announced online May 2020
- Visit <https://ghgt.info/> for all conference information and abstract submission