



IEA Greenhouse Gas R&D Programme

Update Report from IEAGHG

Tim Dixon

*CSLF Technical Group, Champaign
25 April 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



34 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.
- 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: 597 alumni, 59 countries
- 2019 – 8-12 July, International CCS Knowledge Centre, Regina



- 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**

COP24



COP24 · KATOWICE 2018
UNITED NATIONS CLIMATE CHANGE CONFERENCE



United Nations
Framework Convention on
Climate Change



2-14 December 2018, Katowice, Poland

- To complete “Paris Agreement Work Programme” - set of issues that create shared guidance and framework for parties to implement the Paris Agreement.
- Most of key issues were agreed in the ‘**Katowice Climate Package**’ aka ‘Paris Rulebook’ , including:
 - the mitigation section of nationally-determined contributions (NDCs);
 - common timeframes for countries to submit and/or update their NDCs
 - the transparency framework of action and support;
 - Technology Framework;
 - global stocktake;
 - information on future finance provided by developed countries.
- But not
 - Cooperative approaches, including new market mechanism (Article 6)
- *IEAGHG Webinar on COP24 from Arthur Lee on 10 Jan 2019*

UNFCCC Technology Framework



Guiding framework to stimulate development and transfer of climate technologies (mitigation and adaptation) to developing countries – including using Climate Technology Centre and Network (CTCN)

- Overall, technology neutral, and encourages use of existing international RD&D initiatives ie

III Key Themes

A. Innovation

(8b) sharing information on international RD&D partnerships

(8e) promoting collaboration with international technology RD&D partnerships and initiatives

(8f) supporting joint country activities

(8g) identify ways to increase developing country participation in collaborative RD&D.

D. Collaboration

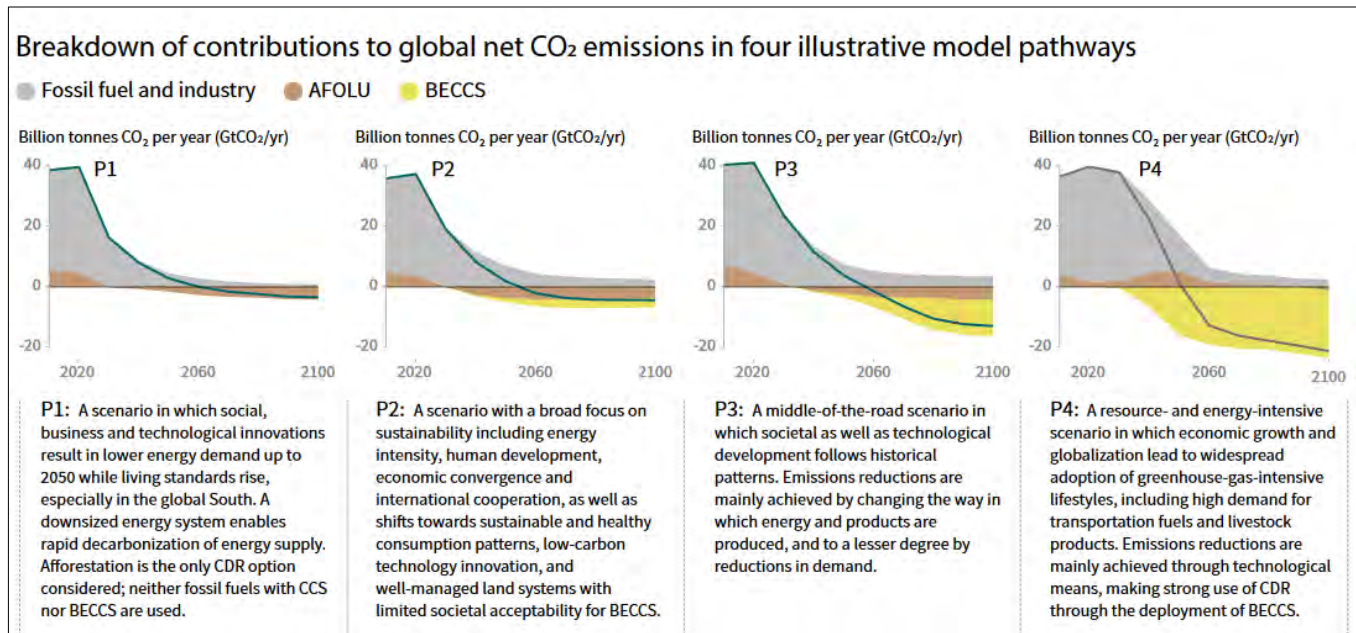
(20d) enhanced collaboration with relevant international organisations including academic and scientific.



IPCC 1.5 Special Report



Fig SPM.3b



- **“Removing BECCS and CCS from the portfolio of available options significantly raises mitigation costs.”** (Chp 4.3)
- IEAGHG Note: IAMs typically assume Capture rate of 90% - this is a limiting factor for CCS deployment from IAMs later this century
 - <https://www.ipcc.ch/report/sr15/>

COP24 CCS Side-event

Can CCS decarbonise industry in developed and developing countries?

Organised by University of Texas and IEAGHG, with CCSA, International CCS Knowledge Centre, Bellona

- Chair and CCS introduction – Tim Dixon IEAGHG
- IPCC 1.5 - Scene-setting – IPCC Vice-chair Thelma Krug
- CCS for Industry Panel: Facilitator – Jonas Helseth, Bellona and EU ZEP
- CCS and Cement Industry - Manuela Ojan, Heidelberg Cement
- Cement, Poland, learnings from BD3. - Mike Monea ICKC
- 'A Just Transition for Industry' – Brian Kohler, IndustriALL
- Role of CCS in net zero emissions for industry – tbc EU ZEP
- CCS for Developing Countries Panel: Facilitator – Katherine Romanak
- Demonstrating storage/Assistance for developing countries – Katherine Romanak BEG UT
- Trinidad and Tobago's perspective – Professor Andrew Jupiter, Uni of the West Indies
- Sustainable Development Goals and CCS – Tim Dixon IEAGHG
- Outcomes of the Global CCUS Summit and UK's support to emerging economies – UK FCO Minister Mark Field MP

➤ 150 attendees and IISD coverage



L-R: Thelma Krug, IPCC Vice-Chair; Tim Dixon, IEAGHG; Jonas Helseth, Bellona and ZEP; Manuela Ojan, HeidelbergCement; Mike Monea, ICKC; Brian Kohler, IndustriALL; David Jupiter, University of the West Indies; Katherine Romanak, UT



Jonas Helseth, Bellona and ZEP



Mike Monea, ICKC



David Jupiter, University of the West Indies



Katherine Romanak, University of Texas



Mark Field, UK



A participant takes a photo during the event



Mark Field, United Kingdom

Photos and captions courtesy of IISD
<http://enb.iisd.org/climate/cop24/enbots/6dec.html>



ieaghg





Update on CSLF and IEAGHG Collaboration

Arrangement between CSLF Technical Group and IEAGHG

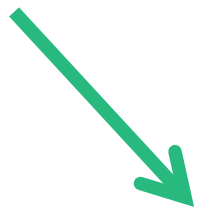


- ***How CSLF TG/PIRT and IEAGHG will interact for mutual benefit through increased co-operation***
 - Mutual representation of each at CSLF TG and IEAGHG ExCo (no voting)
 - Liaison with PIRT co-chairs to discuss potential activities or projects – two way process
 - Activities would require approval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

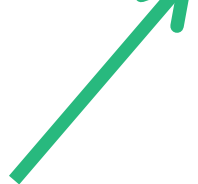


IEAGHG – Study generation

IEAGHG ExCo members



**IEA GHG
Studies**



CSLF TG

Proposal



ExCo

Outlines

**Member
Voting**

Proposals



ExCo



**and
Reports**



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 June 2019

Reports recently published



	Contractor	Report number	Publication date
The CCS Project at Air Products' Port Arthur Hydrogen Production Facility	CKP & Associates Consulting	2018-05	11/01/2019
IEAGHG Modelling and Risk Management Combined Network	Pale Blu Dot	2018-07	28/11/2018
Well Engineering and Injection Regularity in CO2 Storage Wells	N/A	2018-08	28/11/2018
Flaring Emissions Quantification and Mitigation	N/A	2018-TR04	17/12/2018
Sustainability in Petrochemicals	Imperial College, London	2019-01	13/03/2019
Towards Zero Emissions CCS in Power Plants using Higher Capture Rates or Biomass	CSIRO Australia	2019-02	28/03/2019

Reports in progress to be published



Title	Contractor	Publication date
Techno-Economic Evaluation of CO ₂ Capture in LNG Process	Costain	May 2019
Further Assessment of Emerging Capture Technologies - Final	CSIRO	June 2019
Understanding the Cost of Reducing Water Usage in Coal and Gas Fired Power Plants with CCS	CSIRO	October 2019
Sustainable Development Goals and CCS	TNO	June 2019
CO2StCap (Cutting Capture Costs in Process Industries)	Consortium led by Tel-Tek, funded by CLIMIT	July 2019 (by CLIMIT)
Review of Fuel Cell Technologies with CCS	Doosan	April 2019

Studies underway (1)



Title	Contractor	Draft Report date
Refineries and Electricity Production	Wood plc	May 2019
Beyond LCOE - Value of CCS in different generation and grid scenarios	Imperial College	Apr 2019
Gas-and coal-fired power plant with CO ₂ capture	Wood plc	Feb 2019
Addressing Challenges of the Powergrid with CCS	Element Energy	Sep 2019
Value of emerging and enabling technologies in reducing the costs, risks and timescales for CCS	Element Energy	Oct 2019
State of the Art Review of Current and Emerging Storage Technologies and their Benefits (Stage 1)	Battelle	August 2019

Studies underway (2)



Title	Contractor	Draft Report date
Shipping Infrastructure	Element Energy	Oct 2019
Waste to Energy and CCS	Wood plc	Sep 2019
Techno-economic potential of biorefineries with CCS	tbd	tbc

Webinar series



- Established June 2015
- 19 webinars to date

Webinar title	Date	Presenter	No. attendees	No. YouTube views to date
CO₂ Data Share Consortium : Shaping the functionality of the CO2 Data Share platform	20/09/2018	Odd Anderson (SINTEF), Philip Ringrose (Equinor) and Grethe Tangen (SINTEF)	89	24
COP24 Summary Highlights – An Incomplete Paris Agreement Rule Book	10/01/2019	Arthur Lee (Chevron)	34	97
Valuing flexibility in CCS power plants	07/02/2019	Niall Mac Dowel (Imperial College) and Yoga Pratama (Imperial College)	51	58

Research Networks and other events



2019

- **Costs Network**, hosted by EPRI 19-20 March 2019
- **Monitoring Network and Environment Network** meeting, hosted by University of Calgary/CMC, 20-22 August 2019
- **Fault workshop**, hosted by University of Calgary, 23 August 2019
- **PCCC5**, hosted by RITE, Kyoto, 17-19 September 2019
- **HTSL Network meeting**, hosted by TNO in Belgium, dates October 2019 tbc.

2020

- **4th Offshore CCS Workshop**, hosted by STEMM-CCS, location tbd, Feb 2020 tbc.



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