



**IEA Greenhouse Gas R&D Programme  
and  
International Energy Agency**

**Update Report on Activities. ISO TC 265**

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***Sapporo, Japan***

***2 Dec 2016***

# 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



# IEAGHG



## Flagship activities:

- Technical Studies >300 reports published on all aspects of CCS
- International Research Networks
  - Risk Assessment
  - Monitoring
  - Modelling
  - Environmental Impacts
  - Oxy-combustion
  - Post-combustion Capture
  - Solid Looping Capture
  - Social Research
  - Costs
- GHGT conferences



# IEAGHG



Other activities include:

- International CCS Summer Schools:
  - **2016 – Regina, Canada, 18-22 July**
- Active in international regulatory developments – **UNFCCC, London Convention, ISO TC265, EC**
- Peer reviews, eg US DOE, US EPA; CO2CRC
- Collaborations with IEA, CSLF, CO2GeoNet, JCOAL, CCSA, EU ZEP and many others



# Reports published (1)



	Contractor	Report number	Publication date
Can CO2 Capture and Storage Unlock 'Unburnable Carbon'?	SGL/Imperial College London	2016-05	May 2016
Evaluation of Process Control Strategies for PCC	Imperial College London & PSE Ltd	2016-07	September 2016
Risk Management Network and Environmental Research Network Combined Meeting	N/A - Meeting	2016-08	June 2016
4th CCS Cost Network Meeting	N/A - Meeting	2016-09	August 2016
International Workshop on Offshore Geological CO2 Storage (CSLF)	N/A - Meeting	2016-TR2	July 2016
Review of GHG Accounting Rules for CCS	Carbon Counts Company Ltd	2016-TR3	May 2016
Review of Project Permits Under the London Protocol - As Assessment of the Proposed P18-4 CO2 Storage Sites	TNO	2016-TR4	June 2016



# Reports published (2)



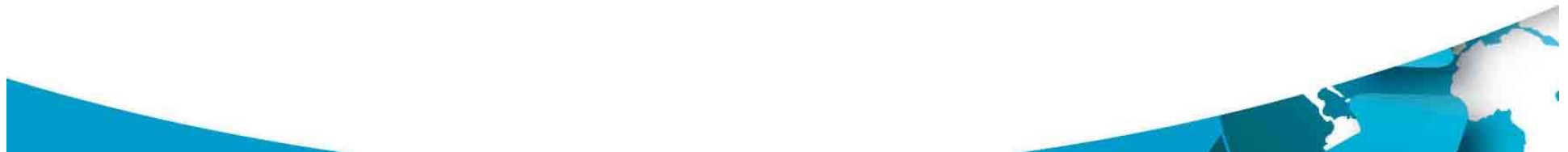
	Contractor	Report number	Publication date
Performance and Cost of Retrofitting CCS in the Pulp and Paper Industry (reference papers)	VTT / ÅF Engineering / IEAGHG	2016-TR5	July 2016
Regional Assessment of Economic Barriers to CO2-EOR	TNO	2016-11	October 2016
Emissions Accounting for CO2-EOR (Members Only)	Carbon Counts	2016-06	October 2016
National CO2 Storage Assessment Guidance	IEAGHG	2016-TR6	October 2016



# Reports in progress to be published



Title	Contractor	Publication date
Hydrogen Production with CO <sub>2</sub> Capture – Techno-economic assessment	AMEC/Foster Wheeler (Italy)	Nov 2016
CO <sub>2</sub> Capture in Natural Gas Production by Adsorption	SINTEF (Norway)	Nov 2016





# Studies being reported



Title	Contractor	Publication date
Techno-economic evaluation of CO <sub>2</sub> Capture for Pulp and Paper	VTT and AF Engineering (Finland)	Oct 2016
Criteria for Depleted Oil and Gas Fields to be Considered for CO <sub>2</sub> Storage	BGS and BEG	Nov 2016
Value of Flexibility in CCS Power Plants	Imperial College (UK)	Dec 2016
Hydrogen Production with CO <sub>2</sub> Capture – Techno-economic assessment of methanol and urea production	AMEC/Foster Wheeler (Italy)	Nov 2016
CCS deployment in the context of regional developments in meeting long-term climate change objectives	Carbon Counts	Nov 2016



# Studies underway



Title	Contractor	Draft Report date
Understanding the Cost of Retrofitting CO <sub>2</sub> Capture in Oil Refineries	Consortium led by SINTEF, cofounded by CLIMIT (Norway)	2017
Regional Variation of Capture Costs	AMEC	August 2016
Leakage into the Overburden	BGS (UK)	September 2016
CO <sub>2</sub> Storage Efficiency – Stage 2	EERC (USA)	September 2016
Evaluating the Commercial and Economic Arrangements to Enable the Deployment of Industry CCS Clusters	Element Energy (UK)	Feb 2017
Techno-Economic Evaluation of CO <sub>2</sub> Capture in LNG Process	Costain	May 2017



# Studies awaiting start (1)



Title	Expected start	Proposal number
Design and Costs of Full Scale Solid Looping CO <sub>2</sub> Capture Plants [Will be split into Calcium Looping with VTT project, and Chemical Looping.]	2016 for Calcium Looping. Awaiting information from VTT project. Chemical Looping to follow later in 2016.	44-03
Further Assessment of Emerging CO <sub>2</sub> Capture Technologies and their Potential to Reduce Costs	Screening phase first. Estimate Q4 2016	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 Q1 2017	48-12
Refineries and Electricity Production	Q4 2016	48-04
Opportunities for CO <sub>2</sub> recycle and use	Q4 2016	48-11
Global Dynamic Storage Capacity in DSF	Q2 2017	49-05
Quantification of the Water-Carbon-Energy Nexus of Bio-CCS	Q2 2017	49-08

# Studies awaiting start (2)



Title	Expected start	Proposal number
Equipment for CO2 Capture		49-04
CCS in Climate Change Mitigation Scenarios		50-07
Well engineering and interventions		50-05
Addressing Residual Emissions from CCS		50-01



# Research Networks and other events



## 2016

- **Monitoring Network** and **Modelling Network** combined meeting. BGS, Edinburgh, UK, 5-9 July

## 2017

- **Monitoring Network**. Battelle. Michigan, USA. w/o 12 June 2017
- **HTSL Network**. SWEREA MEFOS, Sweden. 4-5 September 2017
- **PCCC 4**. NCCC, Alabama, USA. tbc September 2017
- **CCS Cost Network**. Imperial College, tbc September 2017



# Webinar series



- Established June 2015
- 10 webinars to date

Webinar title	Date	Presenter	No. attendees	No. YouTube views to date
Fault Zone Permeability and its importance to CO <sub>2</sub> storage	16/09/16	James Craig	71	58
Can CO <sub>2</sub> Capture and Storage unlock 'Unburnable Carbon'?	13/10/16	Jasmin Kemper	45	28
CCS Cost Trends and Outlook	19/10/16	Howard Hertzog / Keith Burnard		
GHGT-13 Summary	tbc	John Gale		



# London Convention/Protocol



- LC 38 and LP 11. 19-23 Sep, IMO London
- Transboundary Amendment – no progress towards ratification.
- Nigeria presented paper on Offshore Workshop – well received
- IEAGHG presented Report on ROAD project – demonstrated LP CCS guidelines are relevant, workable, and transparency of compliance is possible. Well received by both Parties and Observers



# CCS Activities at COP-22



- **UNFCCC Side event: “CCS Opportunities for Africa”**. 8<sup>th</sup> Nov
- Collaboration with UT, CO2GeoNet, CCSA. Speakers from BHP/SaskPower, S.Africa, Nigeria, Ghana, UT BEG, CO2GeoNet, and IEAGHG (introducing and chairing).



- Booth on CCS information inside UNFCCC Blue area, with CO2GeoNet, UT, CCSA
- IEAGHG also presented at:
  - CO2GeoNet CCS event in EU Pavilion, 7<sup>th</sup> Nov
  - CO2GeoNet CCS event in Public area, 10<sup>th</sup> Nov
  - Oceans and Climate event in Public Area, 10<sup>th</sup> Nov






# GHGT-13



- Lausanne, Switzerland, 14-18 Nov 2016

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



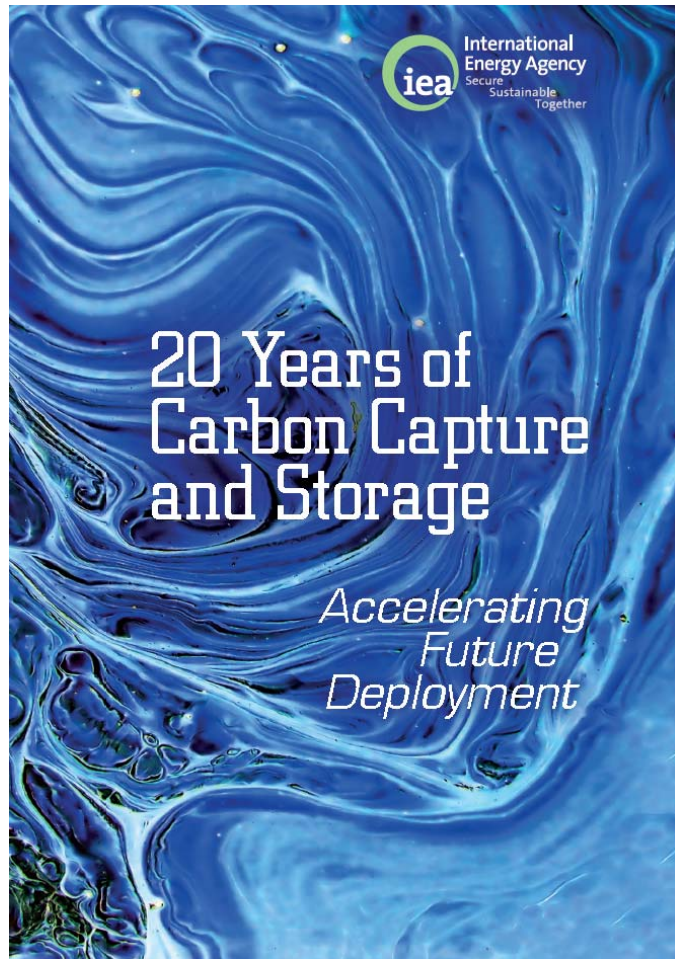
 Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Confederation

Swiss Federal Office of Energy SFOE



# NEW IEA REPORT: 20 Years of Carbon Capture and Storage



New IEA CCS publication,  
released on 15 November.

Three sections:

1. Two decades of progress
2. Towards well below 2°C:  
An increased role for CCS
3. The next 20 years: Picking  
up the pace

Report available at:

<http://www.iea.org/topics/ccs/>

# IEA CCS Regulatory Network



Highlights from meeting held on 23-24 November in Paris:

- Insights and updates from projects on governments, incl (*inter alia*):
  - Tomakomai project, Japan
  - Quest project, Alberta, Canada
  - Regulatory development in Indonesia
- Explored the impact of regulation on project economics
- Detailed discussion of project permitting and regulation in China and the pathway for a CCS project



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