The IEA Greenhouse Gas R&D Programme

An Overview

John Gale
General Manager

IEA Greenhouse Gas R&D Programme
IEA Greenhouse Gas R&D Programme

• A collaborative research programme founded in 1991
• Our main role is to evaluate technologies that can reduce greenhouse gas emissions.
• Aim is to: 
  
Provide members with definitive information on the role that technology can play in reducing greenhouse gas emissions.

• IEA GHG is a IA in which the Participants contribute to a common fund to finance the activities. Funding is approximately 2.5 million US$/year.
IEA Greenhouse Gas R&D Programme

• IEA GHG aims at producing information that is:
  • Objective in evaluating the relative merits of Greenhouse Gas mitigation options
  • Information generated is policy relevant but NOT policy prescriptive
  • We aim to be a trustworthy source of technical information. All IEA GHG studies are:
    • Reviewed by external Expert Reviewers
    • Subject to review of policy implications by Members

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Previous Work by IEA GHG

- This IA has been operating for 15 years. It has:
  - Accumulated >100 studies covering carbon capture and storage (CCS), other mitigation technologies, and alternative energy carriers.
  - Succeeded in establishing CCS as a mitigation option capable of major reductions in the emission of CO$_2$ to atmosphere.
Phase 4

• Finished at end of 2004. During phase 4:
  • CCS moved, from being a technical possibility, firmly onto policymakers’ agendas.
  • Activities expanded to include: research facilitation, research networks, and communications initiatives. Aimed at:

  **Confirming CCS as a major option for climate change mitigation.**
What Does IEA GHG Do Now?

- New 5-year phase started in 2005:
  - 3 Main activities:
    - Generate technology and market information
    - Confidence building
    - Information dissemination
  - Aimed at answering:
    - How do mitigation options compare?
    - Can CCS be done safely and legally?
    - What needs to be done to introduce CCS and be confident it will be successful?
Technology and Market Information

Implementation Support
- Methodology for CCS projects under CDM
- Guidelines for CCS site characterisation
- CCS Project Financing
- Regional capacity for CO$_2$ storage in India

Technical Assessments
- Improved solvent scrubbing processes for CO$_2$ capture
- Capture of CO$_2$ from medium scale installations
- Improved Oxygen production processes
- Collection of CO$_2$ from distributed sources
- CO$_2$ Capture in the cement industry
- Co-production of hydrogen and electricity
- Remediation of leakage from geological storage
- Fuel Cells for CHP
- CO$_2$ Pipeline transmission costs

Regulatory Support
- Risk assessment and regulatory needs
- Environmental impact assessment for CCS
- Capture-ready power plant
- Monitoring Selection Tool
### Reports Issued Since 32\textsuperscript{nd} Meeting

<table>
<thead>
<tr>
<th>Title</th>
<th>Contractor</th>
<th>Publication Date</th>
<th>Report Number</th>
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<tr>
<td>CO\textsubscript{2} capture ready plants</td>
<td>E.ON</td>
<td>May 2007</td>
<td>2007/4</td>
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<td>Impacts of CO\textsubscript{2} leaks on terrestrial ecosystems</td>
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<td>Remediation of leakage from geological storage</td>
<td>ARI</td>
<td>Aug. 2007</td>
<td>2007/11</td>
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<td>Co-production of hydrogen and electricity by coal gasification with CO\textsubscript{2} capture</td>
<td>Foster Wheeler</td>
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<td>Improved oxygen production processes</td>
<td>Rodney Allam</td>
<td>Oct. 2007</td>
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<td>Regional capacity for CO₂ storage in India</td>
<td>BGS</td>
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<td>Assessment of sub-sea ecosystem impacts</td>
<td>MBARI</td>
<td>April 2008</td>
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<td>Fuel cells for combined heat and power</td>
<td>Jülich Research Institute</td>
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<td>CO₂ capture in the cement industry</td>
<td>Mott MacDonald</td>
<td>May 2008</td>
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<td>CO₂ pipeline transmission costs</td>
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<td>Removal of impurities from CO₂</td>
<td>Advantica</td>
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<td>Assessment criteria</td>
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<td>August 2008</td>
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<td>Operating flexibility of power plants with CCS</td>
<td>University of Waterloo</td>
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<td>Safety consideration</td>
<td>HSL</td>
<td>October 2008</td>
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<td>Potential breakthrough capture processes</td>
<td>Innovaro</td>
<td>December 2008</td>
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<tr>
<td>Aquifer storage development issues</td>
<td>CO2CRC</td>
<td>February 2009</td>
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## Studies to be Started

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<tr>
<td>CO₂ capture in the iron and steel industry</td>
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<td>Prospects for storage of CO₂ in EOR</td>
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<td>Prospects for storage of CO₂ in gas fields</td>
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<td>Retrofit and repowering with CCS</td>
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<td>Estimation of CO₂ storage costs</td>
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<td>Best practise guidelines on site characterisation</td>
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<td>Use of biomass with CCS, part 1: combustion processes</td>
<td>32-1</td>
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<td>Capture of lower fractions of CO₂</td>
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<td>Building the pipeline infrastructure</td>
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<td>Long term integrity of storage – well abandonment</td>
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International Research Networks

**CAPTURE**
- International Network for CO2 Capture
- Oxy-fuel Combustion Network
- International Network on Biofixation of CO2 and Greenhouse Gas Abatement with Microalgae

**STORAGE**
- Risk Assessment Network
- Monitoring Network
- Well Bore Integrity Network
Information Dissemination

Quarterly newsletter

Topical Reports

GHGT-9
16th – 19th
November 2009
Washington D.C.
http://mit.edu/ghgt9
Practical R&D Activities

Systems Studies/Capture
- DYNAMIS
- International Test Centre

Technical Reviews
- WEYBURN
- RECOPOL
- OTWAY BASIN PILOT PROJECT

Storage Projects
- SACS/CO2STORE
- CO2REMOVE
- CO2SINK
- MOVECBM
- WEYBURN

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www.co2captureandstorage.info

Support Tools
- Monitoring Selection Tool
- Transmission Calculator
- Storage Cost Estimator

Databases
- CCS R&D&D Database
- CO₂ Emissions
- Risk Scenarios
- Best Practise
- Site characterisation

Host Site
- Network Meetings
- Technical meeting reports

www.ieagreen.org.uk
New Initiatives in 2007

• International Journal on Greenhouse Gas Control launched
  • First year of quarterly editions successfully completed
• International Interdisciplinary Summer School launched
Thank You

Any Questions?

Reference material on IEA GHG can be found at:

www.ieagreen.org.uk

Reference material on CCS can be found at:

www.co2captureandstorage.info