



IEA Greenhouse Gas R&D Programme



# IEA GHG and CSLF Collaboration Opportunities

John Gale

IEA Greenhouse Gas R&D Programme

CSLF Technical Working Group

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[www.ieagreen.org.uk](http://www.ieagreen.org.uk)



## Introduction

- Summary of IEA GHG programme and activities
- Outline current areas where IEA GHG is collaborating with other groups
  - Including CSLF
- Present some outline ideas from IEA GHG for further collaboration with CSLF



# IEA Greenhouse Gas R&D Programme

- A collaborative research programme which started in 1991.
- Its main role is to evaluate technologies that can reduce greenhouse gas emissions.
- Aim is to:

*Provide our members with informed information on the role that technology can play in reducing greenhouse gas emissions*

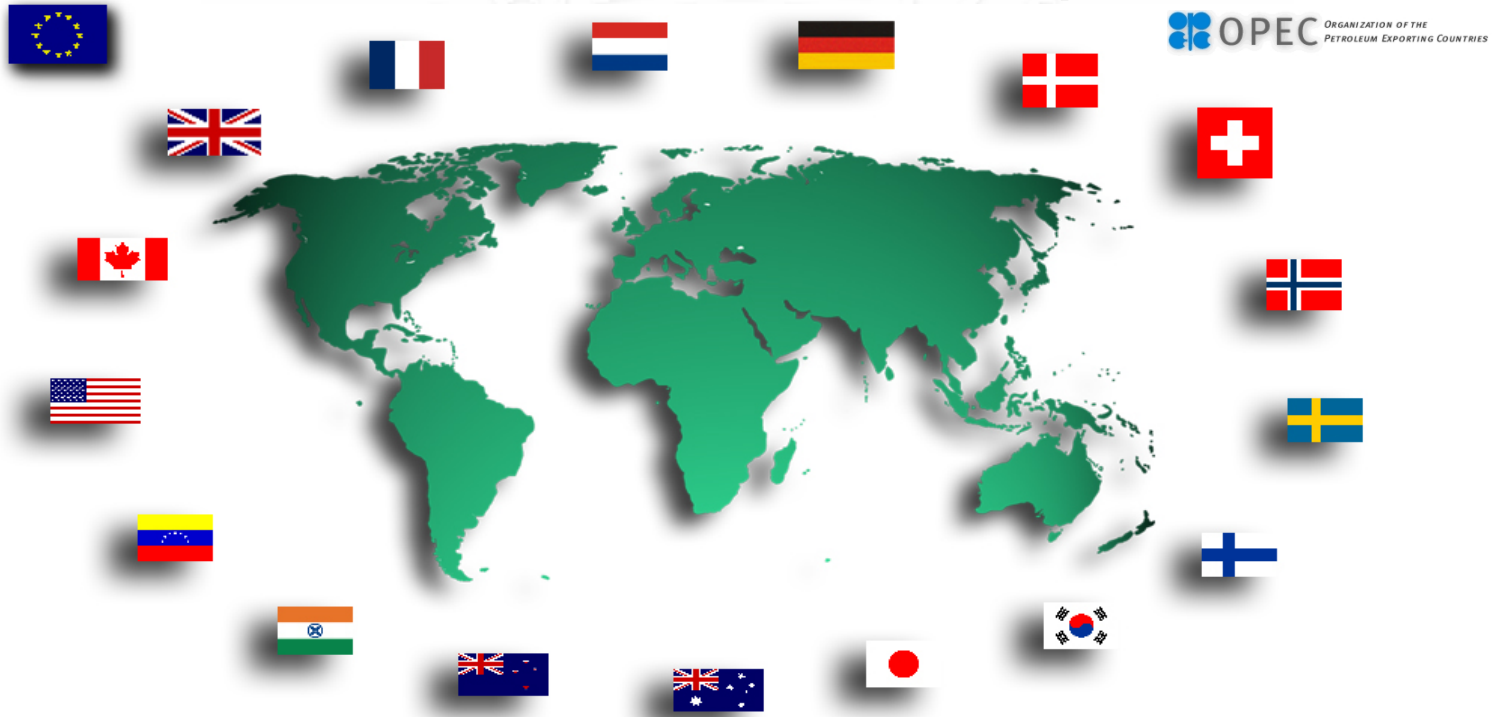
- Cost shared agreement
  - Annual research budget - \$2m per year



# IEA Greenhouse Gas R&D Programme



## Current Membership





## Current Activities

- New phase (5) started at end of 2004:
- Strategic themes:
  - Generating technology and market **Information** on CCS and related options.
  - **Confidence-building** in mitigation technology.
  - **Dissemination** of information about CCS and related options.



## Summary of Activities

### Technical Studies

- Permitting Issues
- Environmental Impact Assessments
- Zero Emission Power Plants
- “Capture Ready” Plants
  - Remediation

### Technical Workshops

- CCS-CDM

### Research Networks

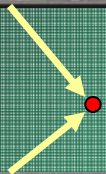
- Monitoring
- Risk assessment
- Well Bore Integrity
  - Oxyfuel Combustion
  - CO<sub>2</sub> Capture

### Communications

- GHGT-Conferences
- International Journal
- International Summer School



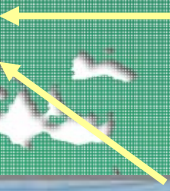
## Current Practical R, D & D Activities



ITC & Weyburn



SACS/CO2STORE/CO2REMOVE



RECOPOL/MOVECBM

OTWAY BASIN PILOT PROJECT





## www.co2captureandstorage.info

CO<sub>2</sub> Sequestration

Introduction

The capture and storage of CO<sub>2</sub> could play a significant role in reducing the release of greenhouse gases to the atmosphere.

Approximately one third of all CO<sub>2</sub> emissions due to human activity come from fossil fuels used for generating electricity, with each power plant capable of emitting several million tonnes of CO<sub>2</sub> annually. [More >>](#)

search for projects here

Search our database of Research and Demonstration projects.

evaluating and improving the feasibility, effectiveness and environmental acceptability of geological carbon sequestration.

- Aimed to provide information source on CCS.
- CO<sub>2</sub> Emission sources database
- Contains database of practical R,D&D projects.
- Hosts risk scenarios data base
- Provides network information
- NEW – Monitoring Selection Tool





## Collaboration Activities (1)

- [WWW.co2captureandstorage.com](http://WWW.co2captureandstorage.com)
  - Data exchange to populate practical R&D database
    - CSLF
    - CO2NET
  - Risk assessment
    - Weyburn projects FEP database
  - CO2 emissions database
    - CO2CRC
    - EC ULCOS project
    - DEFRA – nZEC project
    - Princeton University



## Current Collaboration Activities (2)

- Joint DEFRA/IEA GHG study on assessment of storage potential on Indian sub continent
  - Source/storage opportunity assessment
  - Basinal level capacity assessment
    - IEA GHG methodology and CSLF methodology
- Study complete in mid 2007
- Happy to make data available
  - Global storage capacity database
  - Addresses gap identified in IPCC SRCCS



# Current Collaboration Activities (3)

- APEC Energy working Group
- Project to Explore potential for CO<sub>2</sub> Geological Storage in APEC Region
  - Phase I
    - Global emissions database used
  - Phase II
    - Expert input on training manual
  - Phase III
    - Sponsored capacity building workshops in China and Mexico
    - Experts attended to presenting results
- Keen to participate in further capacity building activities
  - Pursuing further opportunities with APEC/CTi



## Collaboration with CSLF

- Beneficial to co-ordinate our activities
  - Wherever practical avoid overlaps and duplication
- Level of co-ordination at moment through shared participants
  - Trude Sunset, Statoil
  - Bill Reynen, NRCan
    - Chair and co chairs of CSLF Technical Committee
    - Members on IEA GHG Executive Committee (ExCO)
  - Observer at this meeting
- Feedback on activities at CSLF technical meetings and IEA GHG ExCo



## Existing Collaboration with CSLF

- Practical R&D Database
  - Data from CSLF endorsed demonstration projects
  - Link from CSLF site
  - On going
- Media impact study on IPCC SRCCS
  - Reported at Public Education break out group at IEA/CSLF Near Term Opportunities Workshop
- Analysis of gaps in IPCC SRCCS
  - Provided for gap analysis activity for Monitoring & Verification Task Force



## Future Collaboration ideas with CSLF (1)

- Monitoring selection tool
  - Link from CSLF site
    - Accessible to CSLF members
  - Assist with database updates
    - Input on monitoring activities at CSLF endorsed demonstration projects



# IEA Greenhouse Gas R&D Programme



CO2 Monitoring D55 - Microsoft Internet Explorer provided by The British Geological Survey

File Edit View Favorites Tools Help

Address <http://kwu9:8080/co2tool/v2.1/index.php>

## CO<sub>2</sub> Capture and Storage

### Monitoring Selection Tool

[Back to Main Homepage](#)

Contact

**IEA Greenhouse Gas R&D Programme**  
The Orchard Business Centre  
Stoke Orchard  
Cheltenham  
Gloucestershire  
GL52 7RZ

T: +44 (0)1242 680753  
F: +44 (0)1242 680758  
E: [mail@ieaghg.org](mailto:mail@ieaghg.org)

Welcome

### Interactive Design of Monitoring Programmes for the Geological Storage of CO<sub>2</sub>

This Monitoring Selection Tool has been developed to help identify appropriate techniques for monitoring CO<sub>2</sub> that has been injected into a geological storage reservoir.

If this is your first visit we recommend that you look at the [background information](#) to guide you through the process. We also recommend that you [register](#) as soon as possible, as this will allow you to save your outputs and revisit or revise them in the future.

**Start the Design Application**

Login as registered user

Not Registered? - [Register Here](#)

Version 2.1, 18 October 2006  
Released for evaluation purposes only.

The Monitoring Selection Tool was developed and designed at the [British Geological Survey](#) under the [Sustainable and Renewable Energy Programme](#). We are grateful to the members of the [IEAGHG Monitoring Network](#) for their constructive feedback during tool development.

Disclaimer

The development of the Monitoring Selection Tool has been sponsored by the IEA Greenhouse Gas R&D Programme. The views and opinions expressed herein do not necessarily reflect those of the IEA Greenhouse Gas R&D Programme, its members, the International Energy Agency, British Geological Survey (BGS), nor any employee or persons acting on behalf of any of them. In addition, none of these make any warranty, express or implied, assumes any liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed or represents that its use would not infringe privately owned rights, including any party's intellectual property rights. Reference herein to any commercial product, process, service or trade name, trade mark or manufacturer does not necessarily constitute or imply an endorsement, recommendation or any favouring of such products.



## CO<sub>2</sub> Capture and Storage

### Monitoring Selection Tool

[<< back](#)

Scenario summary: New Scenario [2006-10-29 02:39:58]

**Location:** Onshore; **Depth:** 500 to 1500 m; **Type:** Aquifer; **Quantity:** 125.000 Mt (5.000 Mt/yr for 25.0 yrs); **Package:** BGS+Agricultural+Syn-injection+Basic

Tool	Rating %	Plume	Seal	Migration	Leakages	Integrity
<a href="#">3D surface seismic</a>	80	4.0	4.0	4.0	1.0	3.0
<a href="#">Downhole fluid chemistry</a>	60	1.0	2.0	3.0	3.0	3.0
<a href="#">Soil gas concentrations</a>	40	0.0	0.0	1.0	4.0	3.0
<a href="#">2D surface seismic</a>	40	2.0	2.0	2.0	1.0	1.0
<a href="#">Airborne spectral imaging</a>	35	0.0	0.0	1.0	3.0	3.0
<a href="#">Geophysical logs</a>	35	1.0	2.0	0.0	0.0	4.0
<a href="#">Downhole pressure/temperature</a>	35	1.0	3.0	0.0	0.0	3.0
<a href="#">IR diode lasers</a>	30	0.0	0.0	1.0	3.0	2.0
<a href="#">Eddy covariance</a>	25	0.0	0.0	0.0	3.0	2.0
<a href="#">Microseismic monitoring</a>	24	0.9	0.9	1.0	0.0	2.0

**Control panel** [hide](#) [help](#)

**Location**

Onshore	Offshore	Both
✓	✗	✗

**Depth [m]**

500-1500	1500-2500	2500-4000	>4000
✓	✗	✗	✗

**Type**

Aquifer	Oil	Gas	Coal
✓	✗	✗	✗

**Quantity**

Injection rate [Mt/a]:       Duration [years]:

**Monitoring aims**

<a href="#">Plume</a>	<a href="#">Top-Seal</a>	<a href="#">Migration</a>	<a href="#">Quantification</a>	<a href="#">Efficiency</a>
✓	✓	✓	✗	✗
<a href="#">Calibration</a>	<a href="#">Leakages</a>	<a href="#">Seismicity</a>	<a href="#">Integrity</a>	<a href="#">Confidence</a>
✗	✓	✗	✓	✗

**Monitoring package**

BGS (2006)

	Basic	Additional	All
<input checked="" type="radio"/>	✓	✗	✗
Populated Agricultural	Wooded	Arid	Protected
✗	✓	✗	✗
Pre-injection	Injection	Post-injection	Post-closure
✗	✓	✗	✗





## Future Collaboration Ideas with CSLF (2)

- Capacity building activities
  - Encourage developing country participation at GHGT conferences
  - Developing an International Summer School with JFZ, Germany
    - 1<sup>st</sup> seminar to be held in Germany in summer 2007
    - Encourage developing country participation
  - Interact with CSLF to develop list of appropriate universities in developing countries
    - Invite students to participate and send technical papers



## Future Collaboration ideas with CSLF (3)

- Capacity building activities
  - Workshops in developing countries
  - IEA GHG keen to actively participate
    - Supporting sponsorship
    - Input IEA GHG expertise
      - Data from technical studies
      - IEA GHG/international experts



## Demonstration projects

- Proposed that IEA GHG could collate data on and learnings from demonstration projects
  - Some base level work already completed
    - Data on cumulative global injection volumes
    - Data on storage reservoir characteristics
  - Could work with CSLF to provide data on CSLF endorsed projects
  - Could be overlap with PIRT programme?
    - Be aware to avoid overlap
    - Benefits from added value?



## Summary

- IEA GHG first thoughts presented in summary
- Feedback and comments welcomed
- Happy to explore any ideas further