



Strategic Plan Implementation Report

January 2008

Table of Contents

ITEM	PAGE
Task Force Reports	
<u>Policy Group</u>	
Capacity Building Task Force	1
Financial Issues Task Force	3
<u>Technical Group</u>	
Projects Interaction and Review Team (PIRT)	4
Storage Capacity Estimation Task Force	6
Risk Assessment Task Force	8
Other Reports	
Report from CSLF Secretariat	10
Report from Stakeholders	13
Status Reports from CSLF Recognized Projects	
Alberta Enhanced Coalbed Methane Recovery Project	17
CANMET Energy Technology Centre (CETC) R&D Oxyfuel Combustion for CO ₂ Capture Project.....	18
CO ₂ Capture Project, Phase 2 (CCP2)	19
CO ₂ CRC Otway Project.....	21
CO ₂ Separation from Pressurized Gas Stream	23
Frio Brine Pilot Project	24
Regional Carbon Sequestration Partnerships	25
Regional Opportunities for Carbon Dioxide Capture and Storage in China	28
Zama Acid Gas EOR, CO ₂ Sequestration, and Monitoring Project	29

*Capacity Building in Emerging Economies Task Force
CSLF Task Force Strategic Implementation Report (TFIR)
28 December 2007*

1. Task Force Members
<ul style="list-style-type: none">▪ Australia▪ Canada▪ Colombia▪ European Commission▪ India▪ Italy▪ Mexico▪ Saudi Arabia▪ South Africa▪ United Kingdom▪ United States - Chair
2. Purpose of Task Force
<p>The objectives of the Task Force (TF) are to assist emerging economy CSLF Members to develop the knowledge, skills, expertise and institutions needed to deploy carbon capture and storage (CCS) technologies, develop training and educational resources that all CSLF Members can utilize, build on lessons learned from CSLF-recognized projects, and collaborate with other international CCS initiatives.</p>
3. Milestones
<ul style="list-style-type: none">▪ A Workshop on Capacity Building for Carbon Capture & Storage (CCS) for CSLF Members in Emerging Economies was held in Porto Alegre, Brazil on October 18 and 19.▪ One hundred and thirty (130) representatives from 10 countries attended the Porto Alegre workshop. This included participants from at least 15 different Brazilian entities representatives from universities, oil and coal industry, and government.▪ Prior to the Porto Alegre workshop, on October 17, the Brazilian hosts conducted an International Seminar on Perspectives for Near-Term CCS Deployment. Petrobras sponsored the two events and provided the funding for the international speakers. The Pontifical Catholic University of Rio Grande do Sul hosted the events.▪ Porto Alegre workshop proceedings were posted on the CSLF website (by CSLF Secretariat).▪ The Task Force held a meeting on the sidelines of the 3rd G8 Workshop on Early Opportunities for Carbon Capture and Storage held in Calgary, Canada, on November 27 and 28. Representatives from Australia, Canada, the European Commission, the United Kingdom, the United States, and the Secretariat attended the meeting.▪ The third Workshop on Capacity Building for Carbon Capture & Storage (CCS) for CSLF Members in Emerging Economies will be held in Al Khobar (Dhahran), Saudi Arabia on January 27-29, 2008, in combination with the CSLF Technical Group Meeting.▪ The agenda for the Saudi Arabia workshop is being finalized. It is structured into four themes and will be weaved with the Technical Meeting.▪ The four themes for the Saudi Arabia workshop are:<ol style="list-style-type: none">1. Commercial Aspects and Opportunities for Storage of CO₂ in Oil and Gas Reservoirs

2. Technology Roadmaps and Their Importance

3. Issues that Impact CCS

4. The Needs of Emerging Economy Countries

- The next workshop following Saudi Arabia has been scheduled for Capetown, South Africa in mid April 2009 in conjunction with the CSLF Annual meeting.
- Building on the success of the Porto Alegre workshop, Petrobras will host a similar capacity building workshop in Salvador, Bahia, immediately preceding the Second International Seminar on Carbon Sequestration and Climate Change. The dates of the Second International Seminar are September 9 to 12, 2008.

4. Status

- The Chair of the Task Force, presented a 2-year plan for this Task Force to the members during the meeting held in Calgary. The plan was discussed at the meeting and comments on the plan have been submitted to the Task Force Chair. The plan will be finalized in early 2008.
- The Task Force is planning a workshop in conjunction with the 9th International Conference on Greenhouse Gas Technologies (GHGT-9) meeting to be held in Washington, D.C. in November 2008. A workshop at this venue will provide a good chance for increased visibility as the meeting could have as many as 1900 attendees. The workshop would target decision makers. The group decided to follow-up and to continue discussions regarding this proposed workshop.
- The Task Force also plans to prepare core training modules for capacity building based on the materials thus far gathered from the workshops held. The materials would be standardized and aimed at decision-makers from both the public and private sectors.
- Two issues remain to be determined:
 1. The degree of overlap that exists in CCS capacity building between the Task Force, APEC, and the IEA GHG
 2. The capacity building activities that have already taken place in Australia and east Asia
- The complete list of workshops confirmed or proposed is:
 - Saudi Arabia, January 2008 - confirmed
 - South Africa, April 2008 - confirmed
 - Mexico, July 2008 - proposed
 - Brazil, September 2008 - confirmed
 - U.S.A., November 2008 - confirmed
 - India, January 2009 - proposed
 - China, second quarter 2009 - proposed
 - Colombia, second half 2009 – proposed
- The next meeting of the Task Force will take place in Saudi Arabia in January 2008.
- Financing the workshops continues to be an issue of concern and the Task Force members will keep trying to determine options and available opportunities.

Financial Issues Task Force
CSLF Task Force Strategic Implementation Report (TFIR)
31 December 2007

1. Task Force Members
<ul style="list-style-type: none">▪ India – Chair▪ Australia▪ European Commission▪ France (<i>new member as of October 2007</i>)▪ Korea▪ Netherlands▪ South Africa▪ United Kingdom▪ United States
2. Purpose of Task Force
The objective of the Task Force is to develop a detailed plan for financing carbon capture and storage (CCS) projects in emerging economy countries.
4. Milestones
<ul style="list-style-type: none">▪ The Task Force was re-formed at the Paris CSLF meeting in March 2007.▪ A Task Force meeting took place in New Delhi on 11-12 October 2007. Actions from the meeting are described in the Status section, below.▪ The Task Force will meet at the Cape Town CSLF meeting in April 2008. A progress report will be provided to the Policy Group at the Cape Town meeting that includes follow-up for Actions from the New Delhi meeting.
4. Status
<ul style="list-style-type: none">▪ The United States will develop a listing of existing funds, mechanisms, and forums to determine if any can be accessed or utilized for funding CCS activities in developing countries. The Asian Development Bank will provide a copy of a report by former World Bank Vice President Richard Stern which describes many of these entities.▪ The United States will provide details, once available, of the recently proposed International Clean Energy Technology Fund, which is intended to fund projects in the developing world.▪ The Task Force members have been requested to provide comments on proposed conclusions from Task Force meeting, as offered by India.

Project Interaction and Review Team (PIRT)
CSLF Task Force Strategic Implementation Report (TFIR)
30 December 2007

1. Task Force Members

The Team consists of:

- A Core Group comprising the Chair and Vice Chairs of the Technical Group, and other delegates as designated by the Technical Group. Current membership consists of representatives from:

Australia	John Bradshaw
Canada	Bill Reynen
Denmark	Flemming Ole Rasmussen
European Commission	Derek Taylor
Germany	Jürgen-Friedrich Hake
India	Malti Goel
Netherlands	Erik Lysen
Norway	Trude Sundset
Saudi Arabia	Khalid Abuleif
UK	Nick Otter
USA	George Guthrie

The chair is performed via a 3 co-lead approach (currently with Australia, E.C., and UK) with 1 person to change on an annual basis, so ensuring continuity, sharing the work load and providing opportunity for change.

- A Floating Group comprising representatives of CSLF recognized projects with overall management responsibility in the project (e.g. project manager), as well as other subject area experts.

2. Purpose of Task Force

The PIRT has the following tasks:

- Assess projects proposed for recognition by the CSLF in accordance with the project selection criteria approved by the Policy Group. Based on this assessment, make recommendations to the Technical Group on whether a project should be accepted for recognition by the CSLF.
- Review the CSLF project portfolio and identify synergies, complementarities and gaps, providing feedback to the Technical Group and input for further revisions of the CSLF roadmap.
- Identify technology gaps where further RD&D would be required.
- Foster enhanced international collaboration for CSLF projects, both within individual projects (e.g. expanding partnership to entities from other CSLF Members) and between different projects addressing similar issues.
- Promote awareness within the CSLF of new developments in CO₂ Capture and Storage by establishing and implementing a framework for periodically reporting to the Technical Group on the progress within CSLF projects and beyond.
- Organize periodic activities to facilitate the fulfillment of the above functions and to give an opportunity to individuals involved in CSLF recognized projects and other relevant individuals invited by the CSLF, to exchange experience and views on issues of common interest and provide feedback to the CSLF.

- Perform other such tasks that may be assigned to it by the CSLF Technical Group.

3. Milestones

Near-term milestones are:

- Assessment of potential candidate CSLF Projects and make recommendations to the Technical Group as to their suitability. (Ongoing)
- Establish a mechanism for formalizing a relationship between the PIRT and the IEA GHG. (Ongoing)
- Examination of CSLF Technology Roadmap to identify any sections that need updating. (December 2007)
- CSLF Secretariat is continuing to engage with Member countries to obtain links to current Technology Road Maps for each country, and/or strategic planning documents for CCS that they have generated. This item is in response to the PIRT Action Plan item to have a “Technical roadmap developed for each area including links with member country roadmaps”. (Ongoing)

4. Status

- A mechanism for formalizing a relationship between the PIRT and the IEA GHG has been established and agreed formally by the IEA GHG R&D Programme at the ExCo held in Daejon, South Korea on 16-19 October 2007. A request has been received by the PIRT for suggestions for proposals to be carried out by the IEA GHG. Responses are needed by 21st December 2007 and members of the PIRT have been approached for ideas.
- Knowledge gained from the EC Zero Emission Platform (ZEP) project will now be considered for any relevant PIRT activities. Part of this is to seek to use resources from the EC FP7 R&D Programme in the future, this being open to organizations from CSLF members especially developing countries. An EC call for FP7 has been issued on 30th November 2007. It is planned to consider how this can be used at the forthcoming PIRT meeting in January 2008.
- A plan to review and potentially update the CSLF TRM has been established under the leadership of the EC as agreed at the Technical Group meetings held in London in November 2006. A Review Team has been established from within the PIRT in order to make recommendations to the full PIRT and to the Technical Group meeting in January 2008.
- The comprehensive Gap Assessment completed and presented at the CSLF Workshop in Paris in April 2007 is being used in the process of reviewing and updating the TRM and so help identify where CSLF projects to could be encouraged in relation to the CSLF Charter.
- The EC has agreed to continue with the role as the third co-Chair of the PIRT. This means that the co-Chair role rotates an annual basis between Australia, the EC and the UK. The UK has the chair at this time and the rotation will proceed with the EC taking the position in 2008. It should be noted that the EC representative on the PIRT (Manuel Sanchez) has changed his position in the EC and no longer has the CCS responsibility. It is understood that Derek Taylor will be the representative on the EC subject to confirmation.

**Task Force for Review and Identification of Standards
for CO₂ Storage Capacity Estimation**
CSLF Task Force Strategic Implementation Report (TFIR)
11 December 2007

1. Task Force Members

- Stefan **Bachu**, Canada, Chair
- Didier **Bonijoly**, France
- John **Bradshaw**, Australia
- Robert **Burruss**, USA
- Niels Peter **Christensen**, EC
- Sam **Holloway**, UK
- Marcelo **Ketzer**, Brazil
- Odd-Magne **Mathiassen**, Norway

2. Purpose of Task Force

- The main goal of the Task Force is to develop and disseminate a clear set of definitions and methodologies that will allow:
 - 1) Consistent assessments of CO₂ storage capacity in geological media at various levels based on jurisdiction and/or geological domains that will provide decision makers in government and industry with the information needed for making the right decisions regarding CCS implementation;
 - 2) Comparison of CO₂ storage capacity at various levels (country, basin, regional) and among sites;
 - 3) Understanding of the basis for estimation and critical review of results.
- Performance indicators are (updated on September 15, 2007):
 - 1) Adoption of the report by the CSLF Technical Group (*realistic*) - **Achieved**
 - 2) Publication of Task Force work in technical & scientific journals to achieve wide dissemination (*realistic*) – **Achieved (paper in press)**
 - 3) Adoption of definitions and methodologies by CSLF member countries (*realistic*) - **Partially achieved, some member countries are using them**
 - 4) Provision on an ad-hoc basis of support to the CSLF Task Force on Capacity Building and to CSLF member countries on knowledge transfer and estimation of storage capacity (*realistic*) - **Achieved**
 - 5) Adoption of definitions and methodologies by other countries (*ambitious*)
 - 6) Use of the recommended definitions and methodologies by government, research and/or industry groups in producing assessments of CO₂ storage capacity at various levels (country, basin, regional, local and site specific)

Previous attempts to assess CO₂ storage capacity used a wide variety of approaches and methodologies that considered various trapping mechanisms, and data sets of variable size and quality, resulting in widely varying estimates of inconsistent quality and reliability. In September 2004 CSLF established a *Task Force for Review and Development of Standard Methodology for Storage Capacity Estimation*. In September 2005 the Task Force presented the results of Phase 1 in a Discussion Paper in which previous estimates were critically analyzed and gaps in knowledge and/or methodology were identified. In March 2007 the Task

Force presented the Phase 2 Report covering definitions, concepts and methodologies to be used in estimating CO₂ storage capacity that should serve as a basis for collecting the necessary data and properly estimating the CO₂ storage capacity in geological media. In March 2007 CSLF approved three Task Force recommendations to continue work in Phase 3 on:

- Harmonization of methodologies developed by the CSLF Task Force with methodologies developed by other groups, such as the USDOE Regional Partnerships Geologic Subgroup;
- Compilation of representative case studies of CO₂ storage capacity estimation at various scales in various geological settings and different countries;

Provision of support to the CSLF Capacity Building Task Force on knowledge transfer to CSLF-member developing countries.

3. Milestones

- Phase 2 Report to be completed and adopted at the CSLF Joint Meeting of the Policy and Technical Groups in Paris, March 25-28, 2007 - **Achieved**
- Recommendations regarding future work to be presented at the next CSLF Joint Meeting of the Policy and Technical Groups in March 2007- **Achieved**
- Possibly a paper to be submitted to and published in the International Journal of Greenhouse Gas Control, summer 2007- **Achieved, paper published in Issue 4 of Volume 1, 2007**
- Inclusion of definition and methodologies in training materials to be produced by the CSLF Capacity Building Task Force- **Achieved**
- Provision of support to the CSLF Capacity Building Workshops organized between the 2007 and 2008 CSLF meetings – **New, being achieved**
- Harmonization of methodology between the CSLF Task Force on CO₂ Storage Capacity estimation and the USDOE Regional Partnerships Geologic Subgroup - **New**

4. Status

- John Bradshaw and Stefan Bachu have participated and provided lectures at the 2nd Capacity Building Workshop held in Porto Alegre, Brazil, October 17-19, 2007.
- Didier Bonijoly, John Bradshaw, Niels Peter Christensen, Marcelo Ketzer and Stefan Bachu have attended the third G8-IEA-CSLF Workshop on Early Opportunities for CCS, held in Calgary, Canada, November 27-28, 2007, where a recommendation went out to governments to urgently establish assessments of prospective sedimentary basins using appropriate methodology.
- Members of the Task Force are applying the methodology for storage capacity estimation at the country scale to the Indian sub-continent, France and Brazil.

Task Force to Examine Risk Assessment Standards and Procedures
CSLF Task Force Strategic Implementation Report (TFIR)
31 December 2007

1. Task Force
Task Force to Examine Risk Assessment Standards and Procedures: Phase I Activities
2. Task Force Members
<ul style="list-style-type: none">▪ George Guthrie, United States (Chair)▪ John Bradshaw, Australia▪ Bill Koppe, Australia▪ Stefan Bachu, Canada▪ Hubert Fabriol, France▪ Mathieu Feraille, France▪ Claudia Vivalda, France▪ Rabih Chammas, France▪ R.R. Sonde, India▪ Makoto Akai, Japan▪ Chiaki Shinohara, Japan▪ Ton Wildenborg, Netherlands▪ Odd-Magne Mathiassen, Norway▪ Tim Dixon, United Kingdom▪ Howard Herzog, United States▪ John Gale, IEA GHG
3. Purpose of Task Force
<p>In this task force, we will identify potential risks from CO₂ Capture and Storage (CCS) activities and we will examine the risk assessment standards and procedures that could be used to place these risks in context based on their likelihood to occur and their possible consequences. We will focus on risks that are unique to CCS: the risks associated with the injection and long-term storage of CO₂, a reactive, mobile, and buoyant fluid, in geologic reservoirs. Specifically, we will focus on:</p> <ol style="list-style-type: none">1. Risks associated with CO₂ injection (including fracturing, fault re-activation, induced seismicity)2. Risk associated with any CO₂ migration from the storage reservoir, including:<ul style="list-style-type: none">▪ the health, safety, and environmental risks of long-term CO₂ storage▪ the potential impact on natural resources such as groundwater or other resources▪ fugitive emissions into the atmosphere <p>Specific activities of this task force will include:</p> <ul style="list-style-type: none">▪ Review and summarize the existing literature and international activities on geological storage risk assessment▪ Highlight the critical issues▪ Propose what is needed to better understand and manage these risks
4. Milestones
<ul style="list-style-type: none">▪ March 2007 – Initial meeting of Task Force

- June 2007 – Finalize mission statement and agree on planned Phase I activities
- January 2008 – Task force meets at TG meeting in Saudi Arabia. Prior to meeting, a draft of sections 1-3 will be circulated.
- March 2008 – Complete draft circulated for final review
- April 2008 – Complete Phase I activities and report on progress to CSLF

5. Status

- Mission statement completed.
- Draft outline of final report completed
- Action plan for Phase I completed
- Preparing draft of phase I report, including collection of input from task force members on risk activities in each of the countries to incorporate into the report; task force will meet at next technical group meeting (in Saudi Arabia) to discuss draft.

Report of CSLF Secretariat
CSLF Strategic Implementation Reporting System (SPIR)
7 January 2008

A. Meetings and Workshops

- Past
 - Second Capacity Building in Emerging Economies Workshop (18-19 October 2007, Porto Alegre, Brazil). The agenda and all presentations from the workshop have been posted to the CSLF website (see below).
 - Second IEA–CSLF Workshop on Near-Term Opportunities for Carbon Capture and Storage (21–22 June 2007, Oslo, Norway). The agenda and all presentations from the workshop have been posted to the CSLF website (see below).
 - CSLF Financial Issues Task Force Meeting (11-12 October 2007, New Delhi, India). The agenda and all presentations from the workshop have been posted to the CSLF website (see below). The Secretariat developed the minutes for the meeting which were approved and posted at the CSLF website.
 - Third IEA–CSLF Workshop on Near-Term Opportunities for Carbon Capture and Storage (27–28 November 2007, Calgary, Canada). The Secretariat was responsible for obtaining comments on a set of draft recommendations. These comments were summarized and furnished to the workshop attendees. The recommendations resulting from the workshop have been posted to the CSLF website (see below).
- Future
 - CSLF Technical Group (27-30 January 2008, Al Khobar, Saudi Arabia). The Secretariat and the host country, Saudi Arabia, are working together to plan the meeting. The Secretariat has prepared the block diagram and the agenda for the meeting that been approved by the Technical Group Chair and the meeting host. The Secretariat has posted the meeting registration page online at the CSLF web site. Some 30 delegates and observers have registered for the meeting. The Secretariat is sending out acknowledgement e-mails to meeting registrants. All room documents will be posted to the CSLF website at least a month in advance of the meeting. The Secretariat will facilitate all Task Force meetings scheduled in conjunction with the Technical Group meeting. Following the meeting, the Secretariat will develop the minutes for the meeting and, once approved, post them at the CSLF website.
 - CSLF Capacity Building Workshop (27–28 January 2008, Al Khobar, Saudi Arabia). This will be a follow-up to the Pittsburgh and Porto Alegre workshops and will be held in conjunction with the Technical Group meeting. The Secretariat has developed an agenda for the workshop that has been approved by the Task Force Chairman, the Technical Group Chair, and meeting host.
 - CSLF Policy and Technical Groups (13-17 April 2008, Cape Town, South Africa). The Secretariat and the host country, South Africa, are working together to plan the meeting. The meeting will include a Technical Workshop. The Secretariat will set up an online meeting registration page on the CSLF website. Room documents will be posted to the CSLF website at least a month in advance of the meeting. The

Secretariat will facilitate all Task Force meetings scheduled in conjunction with the Technical Group meeting. Following the meeting, the Secretariat will develop the minutes for the meeting and, once approved, post them at the CSLF website.

B. CSLF Public Meeting Place (PuMP)

A CSLF online discussion forum, titled the CSLF Public Meeting Place (or “PuMP”), remains online at the CSLF website as part of an extended trial. Its purpose is to facilitate greater involvement of the stakeholders and to foster greater communications both among stakeholders, and between stakeholders and the CSLF. The PuMP has begun to see more activity after a slow start. The Secretariat has rewritten instructions for using the PuMP to make it easier to use. The Secretariat has also been more actively promoting the PuMP. The Secretariat will report on the performance of the PuMP at the April 2007 Policy Group meeting in South Africa.

C. Updates to CSLF website (www.cslforum.org)

The Secretariat has made numerous updates to the website include the following:

- Agenda and presentations from the Second Capacity Building in Emerging Economies Workshop 18-19 October 2007 in Porto Alegre, Brazil.
- Agenda and presentations from the Second IEA–CSLF Workshop on Near-Term Opportunities for Carbon Capture and Storage 21–22 June 2007 in Oslo, Norway.
- Recommendations from the Third IEA–CSLF Workshop on Near-Term Opportunities for Carbon Capture and Storage 27–28 November 2007 in Calgary, Canada.
- Minutes from the CSLF Financial Issues Task Force Meeting 11-12 October 2007 in New Delhi, India.
- Block diagram, draft agenda, background documents, Technical Group documents, and venue information for the CSLF Technical Group 27-30 January 2008 in Al Khobar, Saudi Arabia.
- A meeting registration page for the upcoming Saudi Arabia Technical Group meeting is now online.
- Listings of Policy Group and Technical Group delegates’ contact information have been updated.

The Secretariat has reviewed and posted numerous news releases from CSLF Members and others that are related to carbon capture and storage (CCS) projects, programs, and events in the “What’s New” section of the CSLF website. The purpose is to help promote CCS outreach and awareness.

D. Other Activities

- The Secretariat analyzed the results of the survey of the Overcoming Barriers to CCS Deployment Workshop that was held 27 March 2007 in Paris, France, and turned this into a discussion paper for the CSLF Technical Group meeting in Saudi Arabia in January 2008. A presentation of these results has been prepared for the Saudi Arabia meeting.

- Over this reporting period, the Secretariat handled approximately 200 pieces of incoming e-mail correspondence.

E. Stakeholders

There are now 108 registered stakeholders, four of which have requested not to be shown in the CSLF website listing. Members are encouraged to have their stakeholders register.

Report from Stakeholders
CSLF Strategic Implementation Reporting System (SPIR)
21 December 2007

United Kingdom Hydrogen Association Report

The United Kingdom Hydrogen Association (UKHA) is continuing the development of fact sheets to advance the understanding of the opportunities and challenges for hydrogen energy technologies in the UK.

The UKHA has also been busy evaluating draft international standards pertaining to hydrogen energy. The UK has recently upgraded membership in ISO TC 197 to P-member status. The UKHA works closely with BSI to facilitate review and comment on draft documents by UK experts in hydrogen energy technologies.

* * * * *

The Carbon Capture and Storage Association (CCSA)

The Carbon Capture and Storage Association (CCSA) and several of its member companies are in discussion with the Government over the details of its Competition to support the building of a pilot carbon capture and storage (CCS) plant to be operational within a decade. The Association and member companies attended an ‘Industry Day’ at the Department for Business, Enterprise and Regulatory Reform (BERR) in November.

The UK is firmly on course to build what will be the first commercial-scale CCS power plant in the world, following an October announcement by the Business and Enterprise Secretary John Hutton that the Government is to support a single ‘post-combustion’ project for a coal-fired power station. This was followed in November by an announcement in the Queen’s Speech on the forthcoming Energy Bill 2008, which will: “create a regulatory framework to enable private sector investment in CCS projects.”

Prime Minister Gordon Brown threw his weight behind CCS development in November, in a speech on climate change to the WWF where he officially launched the Competition.

The large-scale deployment of CCS is widely acknowledged to be the only way to reconcile meeting carbon dioxide reduction targets with the continuing use of indigenous fossil fuels in the UK. But development times can be lengthy and early investment in demonstration plants is essential to meet evolving emissions targets.

The CCSA welcomed the Hutton announcement, which will see a pioneering full-scale plant built by 2014, but is disappointed that the Government has chosen to select just one specific technology: a single coal-fired project where carbon dioxide is captured after the combustion of the fuel, for storage offshore. Plans were already in place to build up to five ‘pre-combustion’ capture projects and, unless there is a change of heart by the Government, these projects will be abandoned, leaving the technology to be developed elsewhere in the world.

The Government says that post-combustion capture is the most relevant technology to the majority of existing coal-fired generation capacity around the world, and that Britain could take a lead in developing and then exporting the technology, particularly to China and India. However, the UK CCS industry is developing a number of technologies for commercial sized projects, including precombustion capture, as well as post combustion, and is looking to develop several plants, for both coal and gas-fired power stations, rather than just one. By choosing to support only one, modestly sized project, the Government will miss the opportunity to make the UK a world leader across the technology options.

CCSA Chief Executive Dr. Jeff Chapman concluded: “This news has severely damaged the confidence of sectors of the industry, and will result in several projects being abandoned after considerable development costs. This particularly affects several pre-combustion CCS projects that were significantly advanced in their development, with a total capacity over ten times the size of this proposal and likely to be installed in a shorter timeframe than that envisaged in the announcement.”

* * * * *

The Australian Petroleum Production & Exploration Association Limited Report

Fairview Power Project

In November 2006, the Federal Government announced AUD 75 million support from the Federal Government Low Emissions Technology Demonstration Fund for a new gas-fired power station coupled with a CCS project to demonstrate the role of deep unmineable coal as a CO₂ sink in Eastern Australia.

The Fairview Project will see a new coal seam gas-fired power station and CCS project constructed at Injune, near Roma in Queensland. Further details are available at www.ausindustry.gov.au/library/LETDF_grantoffers_march0720070327095527.pdf.

Moomba Carbon Storage Project

Santos’ Moomba Carbon Storage Project is designed to store up to 20 million tonnes of CO₂ per annum and 1 billion tonnes over the life of the project. This Project has the potential to transform Moomba from an iconic piece of Australia’s energy infrastructure into a practical and world-leading climate change facility supporting clean energy throughout eastern Australia.

A positive final investment decision would enable CO₂ injection to commence at an initial rate of approximately 1 million tonnes per annum utilising Santos’ own CO₂ sources at Moomba. It then has the potential to scale up to serve as a regional, multi-user carbon storage hub serving eastern Australia where it is projected that volumes could exceed 20 million tonnes per annum over fifty years.

CCS national legislative and regulatory developments in Australia

The industry has continued to present its views to the Australian Government on the proposed development in early 2008 of a national legislative and regulatory framework for CCS activities in Australia.

Gorgon Project

During the second half of 2007 the Gorgon Project in Western Australia received State and Federal Government environmental approvals. We understand that this is the first time a commercial scale geosequestration project has been subject to a formal environmental impact assessment process incorporating a public review and comment period. The Gorgon Joint Venturers still require a number of State Government approvals prior to making a final investment decision.

The Gorgon Joint Venturers are continuing to work with the Federal Government to finalise funding arrangements around the AUD 60 million grant offered as part of the Low Emissions Technology Demonstration Fund. This funding offer is contingent on the Project receiving its final approvals. Further details are available at www.ausindustry.gov.au/library/LETDF_grantoffers_march0720070327095527.pdf.

* * * * *

Jupiter Oxygen Corporation Report

Jupiter Oxygen is a privately held Illinois company that has developed and pioneered a revolutionary technology that makes it both practical and cost effective for electric power plants to capture CO₂, have ultra low emissions and save fuel. Unlike most clean coal technologies being developed, Jupiter's patented process can be either designed into new plants or used to retrofit existing plants. Plus, Jupiter's technology can also be used on gas fired electric power plants, which results in virtually no emissions levels for NO_x.

Background

Jupiter Oxygen is a recognized leader in the development, application and use of oxy-fuel. Jupiter's expertise lies in its continued research, development and everyday use of oxy-fuel combustion. Experimenting and developing the patented oxy-fuel process began in the mid-1990s as a way to cut fuel costs and lower emissions at Jupiter Aluminum, an aluminum recycling and manufacturing business and a patent licensee. Jupiter's technology has been in use at the aluminum plant since 1997, and is now emerging as the most promising environmental control technology for use in both coal and gas fired electric power plants.

Technology Transfer

Since 2001, Jupiter has taken its technology from industrial furnaces to fossil fuel steam boilers and electric power plant test applications. In 2002, the company tested its oxy-fuel technology in a steam boiler using oxygen instead of air, and firing with both natural gas and coal. These successful trials were followed by additional testing in 2004 that proved that it is both practical and cost effective to capture CO₂. The tests were done in cooperation with the US Department of Energy (DOE) and its National Energy Technology Laboratory (NETL). In 2004, Jupiter

Oxygen's technology was also certified by Canada's Environmental Technology Verification Program. Throughout its history, Jupiter Oxygen's developmental goal for its patented oxy-fuel technology has been to reduce NOx emissions, prove that CO₂ can be effectively and economically captured, and improve boiler energy efficiency in order to save fuel. The 2004 tests were coordinated with the U.S. Department of Energy and showed that a clean coal technology based on Jupiter's patented undiluted, high flame temperature oxy-fuel combustion process, combined with the NETL's Integrated Pollutant Removal System, is the path to a cost effective clean coal future for both retrofits and new electric power plants.

Hammond Test Facility

Jupiter is operating a 15 MW thermal oxy-fuel test facility. This research and development facility is testing a 50 MMBtu oxy-fuel burner that serves a 5 MWe equivalent test unit, and provides developmental engineering for power plant retrofits as well as new build plants. The development work is based upon Jupiter's oxy-fuel technology and the U.S. Department of Energy's National Energy Technology Laboratory's (NETL's) Integrated Pollution Removal (IPR) technology. Jupiter Oxygen will advance the creation of a close to zero emission fossil fuel power plant, limiting NOx, SOx, particulate and mercury emissions to ultra low levels even without CO₂ sequestration. The plants will be fully equipped for CO₂ capture and prepared for CO₂ sequestration pipelines. The Hammond test facility is Jupiter Oxygen's 3rd generation oxy-fuel development unit. The unit and testing are being done with NETL.

Major Benefits for Retrofits and New Coal-fired Power Plants

- NOx is greatly reduced with properly designed combustion and burner systems without any back-end emissions control technology. In fact, coal combustion NOx levels in the exit gas are below the federal goal of 0.1 Lbs/MMBtu, and are expected to be 0.05Lbs/MMBtu without any post-combustion emission controls.
- Flue gas exhaust from the boiler is approximately one-fourth that of air-fired boilers, making emission capture easier, as well as more effective and economical.
- CO₂ becomes highly concentrated, making capture easier and more economical with 95%+ capture of CO₂ possible. Since air is not part of the combustion process, there is no expense to separating CO₂ from air prior to compression, unlike with air firing.
- Elimination of key pollutant emissions: 99%+ SOx, 99%+ PM and 90%+ mercury capture. Fuel efficiency is improved because nitrogen uses up a great deal of heat/energy produced by combustion. Furthermore, the patented undiluted flame, high temperature process increases radiant heat transfer and therefore efficiency. Less fuel also means a corresponding reduction of greenhouse gases and pollutants.

Management Team

Jupiter Oxygen's executive management team has years of experience and expertise with the Jupiter oxy-fuel process for manufacturing and power plant development.

- Dietrich Gross, Chairman and CEO
- Mark Schoenfield, Executive Vice President Operations & General Counsel
- Harold Green, Vice President Public Affairs & Communications
- Thomas Weber, Vice President International Business & Sustainable Strategies
- Brian Patrick, Director of Development
- Norm Bell, Chief Project Engineer

Alberta Enhanced Coalbed Methane Recovery Project
CSLF Project Status Report (PSR)
December 2007

1. Project Location
Alberta, Canada
2. Project Lead
Brent Lakeman, Alberta Research Council <ul style="list-style-type: none">▪ Telephone: 1 780 450-5274▪ E-Mail: Lakeman@arc.ab.ca
3. Project Objectives
<ul style="list-style-type: none">▪ Reduce greenhouse gas emissions by subsurface injection of CO₂ into deep coal beds▪ Enhance coal-bed methane recovery factors and production rates as a result of CO₂ injection
4. Recent Milestones
<ul style="list-style-type: none">▪ Completion of a single-well micro-pilot test at Suncor's CSEMP site▪ Baseline seismic survey completed▪ N₂ tracer injected with offset well monitoring completed▪ Long term CO₂ injection initiated and suspended due to well-bore issue
5. Status
<ul style="list-style-type: none">▪ CO₂ testing completed for single well micro-pilot▪ Engineering and Reservoir Modelling analysis being completed for micro-pilot▪ Tiltmeter response being reviewed▪ Analysis of injection well issue completed▪ EUB approval obtained for remedial work on injection well

CANMET Energy Technology Centre (CETC)
R&D Oxyfuel Combustion for CO₂ Capture Project
 CSLF Project Status Report (PSR)
 December 2007

1. Project Location
CANMET Energy Technology Centre, Ottawa, Canada
2. Project Lead
Dr. Kourosh Zanganeh Zero-Emission Technologies Group Clean Electric Power Generation CANMET Energy Technology Centre 1 Haanel Drive, Ottawa, Ontario K1A 1M1, Canada Tel: (613) 996-3916 Fax: (613) 992-9335 Email: kzangane@nrcan.gc.ca
3. Project Objectives
<ul style="list-style-type: none"> ▪ Research, development and pre-commercial demonstration of advanced near-zero emission technologies for the capture of CO₂ from fossil fuel power plants. ▪ Improving the overall economics and performance of the oxy-fuel combustion systems with CO₂ capture. ▪ Development of novel integrated multi-pollutant control strategies for NO_x, SO_x, Hg, and particulate with optimization, integration and low-grade heat recovery. ▪ Experimental investigation of CO₂ capture and compression processes, phase change and the impact of impurities. ▪ Research and development of advanced zero-emission gas turbine cycles. ▪ Development of next-generation oxy-fuel combustion technologies.
4. Recent Milestones
<ul style="list-style-type: none"> ▪ Development and successful testing of a new multi-functional burner. ▪ Development of advanced simulation tools for oxy-coal power plants. ▪ Development of a first-of-the-kind CO₂ capture and compression unit. ▪ Successful testing of oxy-steam pulverized coal combustion with no flue gas recirculation.
5. Status
<ul style="list-style-type: none"> ▪ CANMET CO₂ R&D Consortium research program started in 1994 and is currently in Phase 9. ▪ Pilot-scale experimental investigation and combustion testing at CANMET's Vertical Combustor Research Facility (VCRF) is underway. ▪ New prototypes are either being designed or under construction for testing. ▪ New processes to improve the efficiency and reduce the cost of the CO₂ capture as well as the use of low-value fuels are being developed. ▪ Supporting the pre-commercial demonstration of the near-zero emission technologies. ▪ Consortium technical reports and presentations are confidential. ▪ Web site (members only): http://z429e302r1c50.communityzero.com/

CO₂ Capture Project Phase 2 (CCP2)
CSLF Project Status Report (PSR)
 December 2007

1. Project Location
Project Office: 150 West Warrenville Road, Naperville, IL USA 60563
2. Project Lead
<ul style="list-style-type: none"> ▪ CCP2 Program Manager: Linda Curran, BP ▪ CCP2 Executive Board Chairman: Gardiner Hill, BP ▪ Capture Team Lead: Ivano Miracca, ENI ▪ Storage Team Lead: Scott Imbus, ChevronTexaco ▪ Communications Team Lead: Iain Wright, BP ▪ Policy Team Lead: Arthur Lee, ChevronTexaco ▪ CCP2 Advisory Board Chair: Vello Kuuskraa
3. Project Objectives
<ul style="list-style-type: none"> ▪ Develop technology that will reduce costs and improve efficiencies of CO₂ Capture through advanced technologies ▪ Increase knowledge and reduce uncertainties in technology performance and deliver low-cost CO₂ capture technologies to demonstration stage by 2009 ▪ Demonstrate that geological storage of CO₂ is secure and can represent a viable Greenhouse Gas mitigation technique. Develop technology to address critical issues such as storage site/project certification, well integrity and monitoring ▪ Increase public awareness and acceptance of CCS ▪ A distinctive aspect of CCP2 is the emphasis on collaboration and partnership with governments, industry, NGO's and other stakeholders. The members of the partnership recognize the challenges associated with global climate change require solutions that are economically and socially accepted to all.
4. Recent Milestones
<ul style="list-style-type: none"> ▪ Well Exposure Information: Quantitative assessment of materials stability of a well exposed over several decades to CO₂; additional data has been obtained from the first well examined and plans have been completed for a second well investigation. ▪ Certification Framework: Further development of a stream-lined, integrated, risk-based model for technical assessment of potential storage sites, including operational parameters, monitoring systems, and success criteria for demonstrating long-term containment.
5. Status
<ul style="list-style-type: none"> ▪ Thirteen technologies (post-combustion, pre-combustion and oxy-fuel) have been assessed relative to the ability to reduce CO₂ emissions and readiness for demonstration in 2009 ▪ A rigorous process is underway to evaluate the most promising capture technologies for potential pilot or demonstration ▪ A multi-well evaluation has been undertaken to determine the long-term sealing capacity of wells in a CO₂-rich environment, type and levels of risk posed by failure of well components, and preventative and remediative engineering solutions.

- Novel approaches to optimize the resolution and cost effectiveness of monitoring, leakage detection and verification are under development
- Recent reports: can be found on the CCP2 website:
<http://www.co2captureproject.org/index.htm>

CO2CRC Otway Project
CSLF Project Status Report (PSR)
 December 2007

1. Project Location
Southwestern Victoria, Australia
2. Project Lead
Sandeep Sharma, CO2CRC, Kensington WA 6151, Australia, - Ph: 08 6436 8736 - Mob: 0412 515 494 - E-mail: ssharma@co2crc.com.au
3. Project Objectives
The Otway project has been designed to demonstrate all aspects of CCS, and will demonstrate the geological storage and monitoring of CO ₂ under Australian conditions. It will aim to provide technical information on geosequestration processes, technologies and monitoring and verification regimes that will help to inform public policy and industry decision-makers and assurance to the community. The objectives are the same as previously described.
4. Recent Milestones
<ul style="list-style-type: none"> ▪ Results from 4th trip of soil gas monitoring: executed (Oct 07) ▪ Results from 3th groundwater chemistry trip: executed (Nov 07) ▪ Pre-injection geomechanical analysis of the site: completed (integration of CRC-1 core & log data) (Dec 07) ▪ Perforation of the monitoring well - Naylor-1 (Nov 07) ▪ Workover completion of the observation well (Naylor-1) with an integrated downhole assembly including geophones, hydrophones, P/T gauges and 3 U-Tubes (Nov 07) ▪ Test seismic sensors, P/T gauges and U-tubes (Nov – Dec 07) ▪ First downhole fluid sampling (Nov 07) ▪ Set up U-tubes and collect fluid/gas samples: U-Tube 1 (within gas cap): high P and low P gas and U-Tube 3 (within water leg): High P and low P fluids (Dec 07) ▪ 3D seismic surveys (Dec 07 - Jan 08) ▪ VSP at CRC-1 (Dec 07) ▪ Perforation of CRC-1 (Dec 07) ▪ In situ P/T measurements in CRC-1 (Dec 07) ▪ Injectivity test at CRC-1) carried out (Dec 07); ▪ Pipeline installation (ongoing): <ul style="list-style-type: none"> - Commence horizontal boring on Buttress end (ongoing) - Commence trenching for the rest of the pathway (ongoing) ▪ Continue plant construction (near completion): gas process skid, compressor and air cooler all installed; ongoing electrical work (ongoing) ▪ Pre-startup audit of the site (during construction phase) (Dec 07) ▪ Southern Rural Water: letter of approval to injection CO₂ received (Nov 07) ▪ EPA approval for CO₂ storage: letter pending (ongoing) ▪ Ongoing discussion to resolve long term liability issues (ongoing) ▪ Continue to resolve landowner agreements (ongoing)

5. Status

- Download dataloggers (water level measurements) from water-wells (Feb 08)
- Atmospheric flask sampling (Feb 08)
- Download Lo-Flo & Flux Tower data (Feb 08)
- 5th (last) soil gas monitoring trip to complete baseline (Feb 08)
- 4th trip (last) groundwater monitoring trip prior to injection (Feb 08)
- Complete 3D surface seismic surveys (Jan 08)
- Finalise U-Tube set up and collect samples from the 3 U-tubes for baseline fluid/gas compositions
- Possible more work at CRC-1 well following injectivity testing (Jan 08)
- Complete pipeline installation (Jan - Feb 08)
- Complete plant construction (Feb 08)
- Commissioning of plant & pipeline (Feb – Mar 08)
- Continue to resolve landowner agreements (ongoing)
- Resolve long term liabilities issue (Feb 08);
- Get final approval from EPA (letter)
- Continue community consultation (ongoing);
- **Injection of CO₂ into the depleted gas field Waarre C to start in Mar 2008**
- **Official Opening of the project (Mar – Apr 08);**
- Further develop the Otway Stage 2 activities (ongoing);

CO₂ Separation from Pressurized Gas Stream Project
 CSLF Project Status Report (PSR)
 December 2007

1. Project Location
Japan (membrane development) Pittsburgh, Pennsylvania, USA (testing)
2. Project Lead
Shingo Kazama, RITE (Research Institute of Innovative Technology for the Earth) <ul style="list-style-type: none"> ▪ E-mail: Kazama@rite.or.jp
3. Project Objectives
<ul style="list-style-type: none"> ▪ Development of membrane material for molecular gate function and composite membrane of excellent CO₂ selectivity over H₂ ▪ Development of membrane module ▪ Testing of the module (with NETL, USA)
4. Recent Milestones
<ul style="list-style-type: none"> ▪ Development of membrane material for molecular gate function (2007FY) ▪ Development of composite membrane of excellent CO₂ selectivity over H₂ (2007FY) ▪ Trial product of pencil module (2007FY)
5. Status
<ul style="list-style-type: none"> ▪ 1st duration: 11/2003 – 03/2006 Completed ▪ Development of novel dendrimer materials for CO₂ separation ▪ Fabrication of dendrimer composite membrane modules and their test <p><u>References:</u> Shingo Kazama, Teruhiko Kai, Takayuki Kouketsu, Shigetoshi Matsui, Koichi Yamada, James S. Hoffman, Henry W. Pennline, Experimental Investigation of a Molecular Gate Membrane for Separation of Carbon Dioxide from Flue Gas, Session 30, Proceedings of Pittsburgh Coal Conference, Pittsburgh, USA (2006)</p> <p>Takayuki Kouketsu, Shuhong Duan, Teruhiko Kai, Shingo Kazama*, and Koichi Yamada, “PAMAM Dendrimer Composite Membrane for CO₂ Separation: Formation of a Chitosan Gutter Layer”, <i>J. Membrane Sci.</i> 287 (2007) 51-59 and so on.</p> <ul style="list-style-type: none"> ▪ 2nd duration: 04/2006 – 03/2011 ongoing ▪ Development of novel CO₂ molecular gating materials for a CO₂/H₂ mixture ▪ Test of dendrimer composite membrane under an elevated pressure (12/2007) ▪ Development of membrane modules of CO₂ molecular gate membrane ▪ Bench scale testing (2010FY)

Frio Brine Pilot Project
CSLF Project Status Report (PSR)
December 2007

1. Project Location
South Liberty oilfield, east of Houston, Texas, USA
2. Project Lead
<ul style="list-style-type: none">▪ Susan Hovorka, Gulf Coast Carbon Center, The Bureau of Economic Geology, Jackson School of Geosciences, The University of Texas at Austin, USA<ul style="list-style-type: none">- E-mail: susan.hovorka@beg.utexas.edu▪ Tom Daley, Lawrence Berkley National Lab, Berkeley, California, USA▪ Yousif Kharaka, U.S. Geological Survey, Menlo Park, California, USA
3. Project Objectives
<ul style="list-style-type: none">▪ Project Goal: Early success in a high-permeability, high-volume sandstone representative of a broad area that is an ultimate target for large-volume sequestration.▪ Demonstrate that CO₂ can be injected into a brine formation without adverse health, safety, or environmental effects▪ Determine the subsurface distribution of injected CO₂ using diverse monitoring technologies▪ Demonstrate validity of conceptual and numerical models▪ Develop experience necessary for success of large-scale CO₂ injection experiments
4. Recent Milestones
<ul style="list-style-type: none">▪ Second injection completed October 1, 2006▪ Confirm no-detect at surface of perfluorocarbon tracers▪ Post injection monitoring of second injection completed September 2007
5. Status
<ul style="list-style-type: none">▪ Two short duration injection tests completed: Frio 1, Oct 2004; Frio 2 September 2006▪ Assessment of storage permanence – quantifying residual saturation and dissolution of year long period following injection▪ Post- injection stable conditions attained – monitoring program nearing completion▪ Final repeat VSP prior to plug and abandon scheduled for spring 2008▪ Novel tool assessments – U-tube; tubing-conveyed seismic array, inline pH,▪ Reports can be found at http://www.gulfcoastcarbon.org

Regional Carbon Sequestration Partnerships (RCSP) Project
CSLF Project Status Report (PSR)
December 2007

1. Project Location
Various locations in United States and Canada
2. Project Lead
National Initiative Managed by the U.S. Department of Energy National Energy Technology Laboratory (NETL) <ul style="list-style-type: none">▪ Sean Plasynski, Sequestration Technology Manager, National Energy Technology Laboratory<ul style="list-style-type: none">- E-mail: sean.plasynski@netl.doe.gov▪ John Litynski, Coordinator, Regional Carbon Sequestration Partnerships, National Energy Technology Laboratory<ul style="list-style-type: none">- E-mail: john.litynski@netl.doe.gov
3. Project Objectives
<ul style="list-style-type: none">▪ To coordinate this government/industry effort of seven Regional Carbon Sequestration Partnerships (RCSP) tasked with determining the most suitable technologies, regulations, and infrastructure needs for carbon capture, transport, and sequestration across areas of the United States and Canada.▪ To develop the necessary infrastructure for the future deployment and commercialization of carbon capture and storage (CCS) technologies as a critical strategy for climate change and greenhouse gas emissions mitigation.▪ To implement the RCSP program in three phases:<ul style="list-style-type: none">- The Characterization Phase evaluated opportunities for sequestration. The Partnerships collected data on CO₂ sources and sinks; developed the human capital to support and enable deployment of future carbon sequestration field tests; determined which sequestration approaches were best suited for their specific regions of the country; and studied the regulations and infrastructure needed for potential wide-scale deployment of sequestration.- The Validation Phase is focused on validating the most promising regional sequestration opportunities through a series of small-scale field tests. This phase builds upon Characterization Phase accomplishments and begins field testing of geologic and terrestrial sequestration technologies to provide the technical foundation for Deployment Phase activities.- The Deployment Phase will demonstrate at large scale that CO₂ capture, transport, injection, and storage can be achieved safely, permanently, and economically. The primary goal of the Deployment Phase is the development of large-scale CCS projects across North America. The Partnerships will inject up to 1 million tons of CO₂ per project per year into geologic formations representative of potential sinks in each region.
4. Recent Milestones
<ul style="list-style-type: none">▪ Characterization Phase completed in 2005▪ Regional Carbon Sequestration Partnerships Phase I Accomplishments: http://www.netl.doe.gov/technologies/carbon_seq/partnerships/phase1/workproducts_table.html

- Validation Phase initiated in 2005, with small-scale field tests currently underway and scheduled for completion in 2009
 - Development of the Carbon Sequestration Atlas, which identified over 3,600 gigatonnes of estimated geologic CO₂ storage capacity.
 - Storage capacity estimates being modified by data obtained in the validation efforts
 - Injection of CO₂ into depleted oil and gas fields has increased knowledge of CO₂ capture, transport, MMV requirements, and regulations
 - Ten ongoing saline formation field tests
 - Ten enhanced oil or gas recovery projects are being conducted for value-added CO₂ storage
 - Five ECBM tests conducted at unmineable coal seams
 - Eleven ongoing Terrestrial sequestration projects include no-till farming, conversion of marginal croplands to grasslands and forests, restoring vegetation on mined areas, wetland restoration, and reforestation
- Deployment Phase activities scheduled to begin in 2007 and run through 2017. DOE has awarded the first four large-scale carbon sequestration projects which are the largest single set of such projects issued to date in the world.
 - The Plains CO₂ Reduction Partnership will conduct large-volume geologic CO₂ storage projects in the Alberta and Williston Basins.
 - The Southeast Regional Carbon Sequestration Partnership will demonstrate large-volume CO₂ storage in the lower Tuscaloosa Formation.
 - The Southwest Regional Partnership for Carbon Sequestration will inject several million tons of CO₂ into a deep saline unit present throughout the Southwest Partnership region and many states surrounding it.
 - The Midwest Geological Sequestration Consortium will inject 1 million tons into one of the thickest section of the Mount Simon Sandstone in central Illinois. The Mount Simon is a prolific formation in Illinois, Kentucky, Indiana, and Ohio.

5. Status

- The RCSPs, which span 41 states, 2 Indian nations, and 4 Canadian provinces, include agency participation from six member countries of the CSLF.
- 25 geologic and 11 terrestrial field tests currently underway in the Validation Phase
- Deployment Phase applications submitted in June 2007, with the first four awards announced in late 2007.
- 2007 Regional Carbon Sequestration Partnerships Program Review Proceedings
<http://www.netl.doe.gov/publications/proceedings/07/rcsp/index.html>

6. Links to RCSP Programmatic Information

- Carbon Sequestration Atlas of the United States and Canada:
http://www.netl.doe.gov/publications/carbon_seq/atlas/ATLAS.pdf
- An Introduction to Carbon Capture and Sequestration (video):
http://ims.netl.doe.gov/Video/carbon_sequestration_sept.wmv
- Carbon Sequestration Technology Roadmap and Program Plan 2007:
http://www.netl.doe.gov/publications/carbon_seq/refshelf.html
- Carbon Sequestration Program Environmental Reference Document:
http://www.netl.doe.gov/technologies/carbon_seq/refshelf/nepa/AA%20%20Assembled%20Document.pdf

- Carbon Sequestration Project Portfolio:

http://www.netl.doe.gov/technologies/carbon_seq/refshelf/project%20portfolio/2007/table_contents.pdf

Regional Opportunities for Carbon Dioxide Capture and Storage in China Project
CSLF Project Status Report (PSR)
December 2007

1. Project Location
Various locations in China
2. Project Leads
<p>R Gentile, Leonardo Technologies, Inc.</p> <ul style="list-style-type: none"> • E-mail: rhgentile@lti-global.com <p>R Dahowski, Battelle – Pacific Northwest Division</p> <ul style="list-style-type: none"> • E-mail: bob.dahowski@pnl.gov <p>C Davidson, Battelle – Pacific Northwest Division</p> <p>J Dooley, Battelle – Pacific Northwest Division, JGCRI</p> <p>X Li, Institute of Rock and Soil Mechanics, Chinese Academy of Sciences</p> <p>F Teng, Tsinghua University</p>
3. Project Objectives
<ul style="list-style-type: none"> ▪ Develop the first ever bottom-up cost assessment of the potential to utilize carbon dioxide capture and storage (CCS) across the Chinese economy ▪ Assess the potential and costs for CCS technologies to deploy across regions of China ▪ Inventory large anthropogenic CO₂ point sources from power plants and other industrial sources ▪ Identify potential candidate geologic CO₂ storage reservoirs/basins which could be used for the safe, long-term storage of CO₂ ▪ Examine the economics of CCS and develop cost curves for CO₂ transport and storage via optimized source-reservoir matching
4. Recent Milestones
<ul style="list-style-type: none"> ▪ Continued characterization, refinement, and mapping of inventory of over 1800 large, stationary CO₂ sources ▪ Storage capacity analysis for oil, gas, coal and deep saline formations currently underway
5. Status
<ul style="list-style-type: none"> ▪ Ongoing; expected completion: Summer 2008 ▪ Data collection and synthesis phase of project nearing completion ▪ Refinement of capacity analysis to commence shortly, to be followed by data integration and source-sink matching analysis

Zama Acid Gas EOR, CO₂ Sequestration, and Monitoring Project
CSLF Project Status Report (PSR)
December, 2007

1. Project Location
Zama City, Alberta, Canada
2. Project Leads
<ul style="list-style-type: none">▪ Ed Steadman, Energy and Environmental Research Center, Grand Forks, ND, USA<ul style="list-style-type: none">- E-mail: ESteadman@undeerc.org▪ Steven Smith, Energy and Environmental Research Center, Grand Forks, ND, USA<ul style="list-style-type: none">- E-mail: ssmith@undeerc.org▪ Bill Jackson, Apache Canada Ltd, Calgary, Alberta, Canada<ul style="list-style-type: none">- E-mail: bill.jackson@apachecorp.com
3. Project Objectives
<ul style="list-style-type: none">▪ To validate the sequestration of CO₂-rich acid gas in a depleted oil reservoir.
4. Recent Milestones
<ul style="list-style-type: none">▪ The following reports have been completed to date:▪ Petrographic and Reservoir Quality Analysis: Devonian Aged Dolostone and Limestone<ul style="list-style-type: none">- Zama Field Area
5. Status
<ul style="list-style-type: none">▪ One year of continuous acid gas injection has been completed. Over 9000 tons of acid gas were injected into the structure throughout the first year of injection.▪ Core collection for rock that has been exposed to Acid Gas should occur in late 2007 to early 2008.