

# Carbon Sequestration Leadership Forum Regulatory Workshop Draft Summary of Main Issues and Outcomes

Friday 7 November 2003

BMW Room, Customs House Brassiere, Brisbane, Australia

Chair: George Lynch, United States Department of Energy

Co-Chair: Tania Constable, Australian Department of Industry, Tourism and Resources

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## **Item 1 Introduction, Welcome and Apologies**

Tania Constable outlined the aims and objectives of the workshop, to share different countries' experiences on sequestration, in particular on regulation. Australia has the responsibility of coordinating a paper on legal, regulatory and financial issues for the Italy meeting in January 2004, and this workshop will be an important first step in preparation. A major aim is to begin work on mapping out the various experiences of countries, but without anticipating outcomes, in the absence of all countries involved in the CSLF. All information arising from this meeting will be sent to the US Secretariat for approval and distribution to all CSLF member countries.

## **Item 2 Presentation – Canada, Mondher Ben Hassine**

This presentation outlined the development of capture and storage activities in Canada, focussing on enhanced oil recovery, including the Weyburn and Joffre projects. Potential enhanced coal bed methane projects are also a driver for capture and storage projects. Canada is working on storage protocols to address safety and environmental issues arising out of long term storage. The existing health and safety legislation under provincial jurisdictions is a good basis to start with.

Issues raised included public and private liability and it was noted that the evolution of the industry will make it more certain when the handover should occur. On jurisdictional issues, regulatory issues on storage and health and safety are provincial, while overall frameworks, such as a possible value for CO<sub>2</sub> and trading regimes, are a federal responsibility. A flexible regime is important to deal with new information arising and regulation can evolve.

***Action:** Canada to forward information regarding the second Canadian study currently underway dealing with regulatory and monitoring requirements.*

## **Item 3 Presentation – United Kingdom, George Marsh**

As the UK is a small country and most of the CO<sub>2</sub> storage potential is offshore, they are looking at the international, rather than national, regulatory situation. Three treaties apply to storage in the North Sea - the London Convention (1972), the 1996 Protocol to the London Convention (not yet in force) and the OSPAR Convention (1998). These treaties are primarily concerned with preventing pollution and protecting the marine environment, and sequestration activities are not provided for explicitly.

R&D, EOR and EGR activities seem to be permitted under the treaties, but what is the maximum scale of a demonstration project allowed? The Sleipner project is allowed as it is covered by the provisions for re-injection or extraction of natural resources. The use of existing structures, such as pipelines and offshore platforms, to inject carbon dioxide is prohibited, but the use of purpose built structure is not prohibited. This leads to questions on refurbishing existing offshore platforms and when does this qualify as a ‘purpose built’ structure? There is also some debate as to whether these conventions consider carbon dioxide an industrial waste, and the general opinion is that it is a waste.

The UK runs workshops with OSPAR countries to discuss making changes to the treaties. George Marsh doesn’t see a change happening to the treaties until a regulatory framework is in place which will protect the environment. The UK is facing a decommissioning stage for their oil and gas sector and had a commitment in the Energy White Paper to look at the use of CO<sub>2</sub> for EOR. However, the costs seem too large, in part because the pipeline infrastructure is not capable of carrying CO<sub>2</sub>.

#### **Item 4            Presentation – United States, George Lynch**

The presentation gave an overview of carbon sequestration – what it is, why it is needed, and how the CSLF is responding to the challenges, as per the slides provided. CSLF is focusing on geologic formations for storage, as this is the most advanced among the storage technologies and offers the greatest potential for near-term impact. National and international legal and regulatory issues are a key issue for the CSLF Policy Group. Australia has the lead for the Legal, Financial and Regulatory Task Force, and today’s workshop is to discuss the regulatory issues component.

In the US, the Environmental Protection Agency (EPA) has expressed that CO<sub>2</sub> is not considered a pollutant within the scope of the *Clean Air Act Amendments*, so essentially the EPA does not currently believe that it has the authority to regulate CO<sub>2</sub>. Several States have been proceeding to set CO<sub>2</sub> emissions standards for power plants.

The CSLF Secretariat is preparing a Draft Roadmap at a summary level that includes major milestones out to 2013, including a Draft Vision Statement, Draft Project Recommendation Guidelines, and a Draft Database Template. These items will be presented in Italy with the aim of gaining consensus approval amongst members. The Secretariat will be sending out a large package of information around 10 December for consideration by members for the meeting in Pisa, Italy.

#### **Item 5            Presentation – China, Prof. Wu and Assoc. Prof. Liu**

China is still coming to terms with how to apply sequestration to climate change, but attach great importance to the issue. They hope to further their understanding of sequestration technology through international communication and cooperation. China trusts the international community will consider the needs of developing country members and provide capital, technical assistance and staff training.

China is proposing research on the following technical issues: long term verification of reliability in terms of technology and geological conditions; measurement of carbon dioxide; long term monitoring; and separation and collection of carbon from flue or synthetic gas. There is a pilot project in Shaanxi province in cooperation with Canada involving enhanced coal bed methane recovery and about 15 wells. There are steel and chemical plants in the vicinity.

**Item 6                    Presentation – Japan, Takashi Ohsumi**

Japan has a small scale CO<sub>2</sub> demonstration project in Nagaoka which is proposing to sequester 20 tonnes per day over about 1.5 years into a geological formation at about 1.1 kilometres depth. The project is being run by the Research Institute of Innovative Technology for the Earth (RITE), with 100 per cent funding from Ministry of Economy, Trade and Industry (METI). Public awareness and community acceptance is very important as the project is only 3 kilometres from the nearest city. Fault lines are also an important consideration for Japan. Data from the project will be compiled by March 2004.

The small scale demonstration project is onshore but as Japan is a mountainous country with active faults, the target for aquifer sequestration is offshore. These targets are only 2-3 kilometres from the coast, but the London Convention will be an important consideration.

**Item 7                    Presentation – Australia, Stuart Smith**

Australia has a number of possible sequestration projects, including the Gorgon gas project and the APEL coal gas-to-liquids projects. Australia is currently working on establishing a nationally consistent regulatory framework which establishes clear rights, responsibilities and obligations on geosequestration, and is consistent with international treaties and conventions. A reference group has been established comprising government officials, researchers and industry to consider these issues and make recommendations for governments' consideration. This work will also feed into Australia's contribution to the CSLF.

Australia has developed a list of key issues which will be considered in a regulatory framework: ownership/ property rights; liability; environmental issues; authorisation and compliance; monitoring and verification; transportation; cross-jurisdictional issues; and financial issues.

**Item 8                    Presentation – Australia – Technical, Dr Peter Cook**

Australia has undertaken a regional assessment of CO<sub>2</sub> storage potential, and is now looking at specific sites in more detail. Dr Cook gave an overview of the Australian road mapping exercise, which will be presented in Italy at the Technical Working Group meeting. There are three stages identified in the road mapping exercise: R&D; demonstration and commercial projects; and advance systems. Priorities for Australia

have been identified such as IGCC for black coal and brown coal, oxyfuel combustion, ultra clean coal technology. Geosequestration is seen as an essential component of zero emissions technology.

Dr Cook presented a timeline showing progress towards the hydrogen economy, incorporating projects such as Sleipner and Weyburn, post carbon capture projects such as Teapot Dome, demonstration gasifiers and commercial projects like In Salah and Snohvit. Research and commercial projects have to run in parallel in order to maximise the benefits of the next 20-30 years of this work. The key elements of this progression towards the hydrogen economy are: community acceptance of geosequestration; effective integration of CO<sub>2</sub> capture and storage; zero emissions electricity; and increased hydrogen use by 2030.

### **Item 9                    Presentation – Message from India**

India has not yet begun working on regulatory issues, but is very keen to receive information and to be involved through the CSLF. India is working on technology tracking in the following areas: post combustion capture; pre-combustion capture; various sequestration processes; and measurement, monitoring and verification techniques. Collaborative research is focusing on pre-combustion; CO<sub>2</sub> sequestration; and participation in the US\$1 billion 275 MW integrated carbon sequestration and hydrogen research initiative with zero emission pollutants proposed by the US Government for development by 2012.

### **Item 10                    Discussion of Key Issues**

Participants discussed the key issues arising from the presentations made. This discussion of issues is in preparation for the paper which Australia is coordinating as the lead of the Legal, Regulatory and Financial Issues Taskforce, and will be presented at the Italy meeting in January 2004. There was some discussion on what is achievable in this short time frame since it is important that all member countries will contribute to the paper.

One proposal for a framework was to use the life cycle approach based on the Canadian paper and look at the issues under four main areas: pre-injection; injection; pre-abandonment; and post-abandonment phase; as well as transportation and general issues. The issues identified under each of these headings are in the slides below.

A second framework was proposed which looks at the event, impact, owner and whether there are existing regulations for each of the four main stages of the project. This 'gap analysis' framework is in the slide below. It was agreed that this would be the framework and Australia will fill in the table and circulate it to the Secretariat for clearance and distribution to member countries to complete. In this way we can produce a table showing what work, if any, member countries have done on sequestration regulation. This could then provide the basis for further work, and to utilise existing

work which has already been done. For instance, the UK has already done a lot of work on international conventions which will be useful for other countries to draw on.

The use of case studies was also proposed as a way of identifying issues. For instance, six case studies could be presented at the Italy meeting and then three could be selected. The case studies should be balanced between demonstration and commercial projects, oil and gas and coal projects, cross-jurisdictional and onshore/ offshore issues, be sited in different member countries, should be live projects, and the project proponents must be prepared to work with the CSLF.

It was agreed that the regulatory paper to be presented in Italy will cover the following:

- present a framework for addressing regulatory issues;
- a definition of issues relating to sequestration technologies;
- identify existing regulation and gaps through the tables;
- some information on research methodology; and
- suggest a number of case studies to be developed after the Italy meeting.

***Actions:***

	<b>Action</b>	<b>Date</b>
<b>(1) Paper</b>		
Australia	Draft paper for presentation to the Policy Working Group at the Italy Policy Working Group meeting.	28 November
US, UK and Japan	Provide initial comments on the draft paper.	5 December
Australia	Send draft paper including comments from US, UK and Japan to the Secretariat for circulation to member countries.	8 December
<b>(2) Gap analysis</b>		
Australia	Complete gap analysis table as an example and circulate to member countries through the Secretariat for their completion.	8 December
Member countries	Complete gap analysis table and send to Secretariat and Australia. Australia to compile information received for presentation at Italy.	5 January
<b>(3) Minutes and paper from workshop</b>		
Australia	Draft record of meeting and summary minutes from this Workshop and send to Secretariat for circulation to member countries.	14 November

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General Issues:

- Carbon Trading
- Flexibility in R&D & Demonstration/Pilot Projects (Case studies)

Regulatory Issues:

- Analysis existing vs. new regulatory regimes and alternatives
- Framework for assessment:**
  - Identify & assess risks
  - Evaluate consequences
  - Attribute responsibilities

◆Pre-injection phase

- Systems analysis- ownership, health and safety, ecology, integrity etc.
- Site selection criteria (risks i.e. slow vs. large-scale leakage)
- Environmental assessment & standards
- Facility sighting & permits
- Location & matching – source, transmission & sink
- Risk assessment - methods & processes
- Ownership & Property Rights
- Liability

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Regulatory Issues:

◆Transportation phase

◆Injection phase

- Safety
- Impact (Resource/ Environment)

◆Pre-abandonment phase

- Safety
- Impact
- Potential risk of leakage

◆Post-abandonment phase

- Potential risk of leakage
- Liability/ Responsibility

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GAP ANALYSIS

	EVENT	IMPACT	OWNER	EXISTING REGULATION
CAPTURE	<i>Leakage</i>	<i>Safety/ Environment</i>	<i>Operator</i>	<i>Yes</i>
TRANSPORT				
INJECTION				
POST-CLOSURE				