NGO Focus Group Meeting

Wednesday December 6th 2006

Phoenix Park Hotel, 520 N Capitol Street NW, Washington DC 20001

Meeting Objectives

Communicate the program, objectives and expected results of the CO_2 Capture Project Phase 2. Investigate issues that need to be tackled in order to move from R&D to deployment of CCS, focusing on policy and regulatory options.

Provide opportunities for ongoing NGO engagement and participation to help shape and steer the CCP2 program in 2007 and 2008.

Participants

Scott Anderson	Environmental Defense
Matthew Banks	WWF
Matthew Bramley	PEMBINA
John Coequyt	GreenPeace
Steve Crookshank	API
Andrea Disch	WRI
Jim Dooley	PNL
Antonia Herzog	NRDC
Jeff Logan	World Resources Institute
Bob Kane	US DOE
Dina Kruger	US EPA
Sasha Mackler	NCEP
Katrina Managan,	NWF
Jennifer McKnight	The Nature Conservancy
George, Peridas	NRDC
Svend Søyland	Bellona Foundation
John Thompson	Clean Air Taskforce
Kate Zyla	Pew Center
Sarah Wade	AJW
Gardiner Hill	CO_2 Capture Project & BP
Iain Wright	CO_2 Capture Project & BP
Linda Curran	CO_2 Capture Project & BP
Tiffany Rau	CO_2 Capture Project & BP
Scott Imbus	CO_2 Capture Project & Chevron
Arthur Lee	CO2 Capture Project & Chevron
Eric Benyon	CO_2 Capture Project & Suncor
Stephen Kaufman	CO_2 Capture Project & Suncor
Cal Cooper	CO_2 Capture Project & ConocoPhillips
Tom Brownscombe	CO_2 Capture Project & Shell

Meeting Structure and Content

Presentations were given by CCP participants (see agenda below) outlining technologies being developed by CCP Phase 2. In addition, a few non-CCP2 participants were asked to prepare some different perspectives on CCS to further stimulate discussion:

Agenda

8:30	Coffee	
9:00	Welcome, Introductions, Safety, Review Agenda	
9:05	Context Setting: what are the main questions about the status of CCS as a technology?	Group Discussion
9:30	Introduction to CCP2	Gardiner Hill (BP)
9:45	CCP2 Capture Program	Tom Brownscombe (Shell)
10:30	CCP2 Storage Program	Scott Imbus (Chevron)
11:30	Break	
11:45	Context Setting: What is the potential role of CCS – (discussion of CCS deployment: integrated assessment model results)	Jim Dooley (PNL)
12:00	Context Setting: CCS Deployment pathways/hurdles – ENGO and project developer perspectives	John Thompson (CATF) Tiffany Rau (BP Carson)
1:00	Lunch	
2:00	CCP2 Policies Program	Arthur Lee (Chevron) Group Discussion
3:00	CCP2 Communications Program	Iain Wright (BP)
3:15	IEA WPFF Communications Strategy	Sarah Wade
3:30	CCP2 Program: Discussion / Next Steps • ENGO Feedback	Iain and Sarah
4:00	Close	

CO2 Capture Project

Questions and Feedback

Feedback Summary – Take Away Points

Feedback focused primarily on the policy ramifications of the CCP2s work:

1. NGOs observed that the posture of the CCP2 regarding climate change and the long term role of fossil energy will have a big impact on the public perception of CCS.
2. There was significant discussion about the potential role of CCS in addressing climate and it is clear that there is some support and some real skepticism about it.
3. NGOs urged the CCP2 to take a more proactive stance through its policy activities.
4. NGOs also supported the efforts to develop a certification framework to help communicate the risks and mitigation options associated with CCS and to begin to establish guidelines for selecting CCS locations.
5. NGOs suggested more frequent contact regarding the CCP2 efforts.

Full presentations are available on the CCP2 website (www.co2captureproject.org). Below is a summary of questions (Q), comments (C), discussion (D) and answers (A) grouped by primary topics:

1. Capture Technology
2. Storage Security
3. Policies and Regulations
4. Large-scale deployment issues
5. General

Capture

C1. There is a changing sense that retrofits are important for two reasons:
(A) the large number of Coal-fired power plants using Pulverised Coal (PC) technology being built around the world will lock us into an unacceptable carbon shadow unless we can develop retrofit options and
(B) it seems that the costs of retrofitting PC is converging with cost of IGCC.

C2. The distinction of pre-and post-combustion is too broad. There are some applications, for example, cement, that will require capturing CO2 at the tail end. We need to keep these kinds of sources in mind.
D1/2 – CCP2 will consider these views in shaping CCP3 activities.

Q1. Why isn't CCP2 doing more on retrofit technologies?
A1. There are two parts to this response. One issue is that there is more to consider than simply the technology, in addition there are issues of space and shutdown time for retrofits. This relates to a second consideration: the CCP2 set ambitious goals for research conducted through the program to yield significant cost reduction results within a short timeframe. CCP2 did not see any opportunities to invest in research that would meet this criterion. That is not to say that retrofit options will not evolve, it's just that CCP2 did not choose to invest in them during this round of research.

Q2. Can you use the capture technology referred to as “Best Integrated (post-combustion) Technology” (BIT) for retrofits?
A2. Yes, but it would require turbine shut-down for quite a long time.

C3. A concern was expressed that the issue of reliability of IGCC is something of a red herring and that the more important issue was a cultural one. To make the human capital changes necessary in the utility industry to implement a fleet of IGCC or even advanced retrofitted PC units is huge. This concern is becoming an increasing point of focus
D3. CCP2 will consider these remarks.

Storage
Q3. Does the industry understand the geomechanical/geochemical issues around CO2 storage, particularly when there are reservoir faults present? To what extent is this work proprietary?
A3. This is an area of study for CCP2. Most of the work is being carried out by academic organizations and is widely available in the oil and gas industry and available to the public. Most State geological regulators will be well aware of the issues.

Q4/C4. What is the value and feasibility of doing tests that deliberately stress reservoirs through pressurization or faults?
A4/D4. Some participants consider this kind of research to be among the most important right now. Others in the room suggested it would be a mistake to even attempt such research because of the potential implications for public acceptance – what community would get the reservoir pushed to the limits? How big would the test have to be to yield meaningful results? How would the liability be managed? It was commented that if small scale stress tests were conducted it would be important to share the information broadly.

Q5. Frio test – Do we understand the interaction of CO2 with heavy metals?
A5. The Frio test is not one of the CCP projects but there is some familiarity with the project. The short answer is “yes”, the chemical processes are relatively well understood. Metals dissolve close to the well-bore and precipitate elsewhere in the reservoir. A small amount of dissolution was predicted before injection started. The project results confirmed the predictions but also showed some additional metals response which is now being investigated and is believed to be linked to interactions between brine and metal equipment in the test well.

C5. Potential disposal of nuclear waste at Yucca mountain (AZ) is not a good comparator because technically it is very different than the storage facilities envisioned for use in CCS. How do we ensure that the public does not look to Yucca as the image of CCS?
D5. CCP2 is aware of this and attempts to use accurate images and analogies.

C6. There is a need to build a small number (5-15) industrial-scale CCS plants, to find out how expensive CCS is really going to be and what the risks are.
D6. Agreed.

C7. There is a need to more accurately explain the processes CO2 might undergo after injection. This raises the question of when is a leak a leak?
D7. This gets at the issue of containment. There is a need to be more clear about the use of multiple layers of reservoir and caprock to contain injected CO2 such that some movement between layers may be acceptable.

Policies and Regulations

Q6. Most of your government funding is coming from Europe. What is the US doing in this area?
A6. The US DOE is contributing some funds to CCP2 but not as much as it did during CCP1. CCP2 views its work as complementary to other research that DOE is funding. CCP2 continues to share results with DOE and with others in the research community. It is also worth noting that EPRI will likely join CCP2 as an affiliate member, helping to disseminate results to EPRI members.

Q7. Are you collaborating with China?
A7. Yes, CCP2 is working with the Chinese on the Dalian project which is focused on membrane development for a capture technology. There was not additional discussion about this topic although there is some interest in whether CCP intends to increase the level of collaboration and the lessons that have been learned so far.

Q8. There are regulations being developed elsewhere including Europe and Australia. How can the CCP2's work in these countries in conjunction with the regulatory process inform US regulators as they seek to do this?
A8. CCP2 relies on briefings and the work of its individual members to share findings in other countries and in the research with stakeholders including the US EPA. CCP2 is also aware that the US EPA is assessing short- and long-term regulatory needs. The upcoming RCSP pilot projects will likely be Class V (experimental), but EPA is now discussing a possible new Class (6?) for long-term CO2 storage. CCP2 and its member companies will share its results with people involved in those processes and will also likely participate in those regulation development processes as a stakeholder.

C9. Current regulatory structure is set up to make yes/no decisions about projects put forward for consideration – they do not create a process for planning how best to deploy CCS. Likewise, current regulatory frameworks are designed to protect drinking water supplies, not to ensure that injected CO2 remains underground or to accurately measure how much CO2 is stored. These two issues (siting and measurement of avoided CO2) need to be addressed. There is some thought regarding siting that "capitalism" or market forces will lead to efficient decisions about EOR but it is not clear that the same forces will ensure good decisions in deep saline formations.
D9. CCP2 will consider this in the context of work on the certification framework.

C10. There is no policy driver that will result in a significant scale up in CCS from the research scale to commercial deployment scale. This leads to concern that efforts to develop CCS will not actually help to address climate change in a meaningful timeframe. In turn, this leads to concerns that CCS is not an essential component of efforts to reach acceptable atmospheric stabilization levels.
D10. Phase 3 of CCP is planned to be industrial-scale demonstration of some CCP2 technologies, which would be a major step towards commercial deployment. There are efforts underway in Europe to develop deployment plans that are consistent with addressing climate change in a meaningful timeframe. CCP will consider how to help facilitate communication of this information with stakeholders in North America.

C11. Several participants took issue with CCP2's position that CCS should be included in the CDM. Specifically, given that current CDM credit prices are about $6/tonne, and the position that such carbon values are not enough incentive to induce major investment in CCS projects, it seems disingenuous to ask that CCS be included in the CDM. Even if it were included, it seems like it would not induce a level of investment that could bring about a major step forward in CCS. One participant made the argument that CCS is not sustainable and so should not be included in the CDM. Instead they argue that CCS should be considered under Article 9.
D11. The CCP2 thinks that not allowing CCS in the CDM will have a chilling effect on investment in CCS. Even at $6/tonne, there might be some gas processing units that would opt to sequester CO2 instead of venting is to the atmosphere.

Deployment

C12. One participant made the case for IGCC by pointing out the following: Although IGCC is more complicated and currently less reliable than a conventional pulverized coal plant, it offers significant environmental benefits in addition to CO2 capture – lower local pollutants and less water required. IGCC is also a technology platform from which it can be expected that additional technological improvement will be made. IGCCs are more like chemical plants than power plants, so while power utilities have very little operational confidence, this is an area that the large integrated O&G companies are very familiar with. There are currently only four industrial-scale IGCCs operating, but if more are built, the reliability will improve and the operating costs will reduce.
D12. Agreed.

General

Q9. How much are you spending on this project?
A9. CCP2 is spending about $25mm over 3 years, split roughly 50/50 between industry and government.

Q10. Is CCP a large part of the global effort?
A10. CCP2 is one of the largest integrated projects, but represents only a small fraction of the global R&D effort into CCS technologies.

Q11. Who owns the intellectual property developed by the project?
A11. For most technologies, the technology provider owns the IP, but the CCP2 participants generally have use rights. CCP2 also publishes a compendium of research results that are available for a minimum fee.

C13. It appears that CCS requires an infusion of capital to overcome some technology challenges. A fundamental question in deciding how much to support the jump starting of CCS is to determine whether you think CCS is essential component in effort to stabilize atmospheric concentrations of CO2 at levels in the 450-550ppm range.
D13. Some participants believe that the political and economic reality is that coal will be used in large quantities for the foreseeable future. Given this view of reality, CCS is deemed an essential component. Others disagree with that vision of reality and also believe that alternative options such as energy efficiency and renewable energy can achieve necessary reductions. To these groups, CCS is not an essential component and there is a real question about whether the levels of investment in CCS are warranted.

Q12. How will the CCP2 determine if it was successful in implementing this stage of the projects?

A12. CCP2 offered three success criteria: (1) reduce capture costs by 50%, (2) develop one technology so that it is ready to be demonstrated in CCP 3, and (3) create some basic tools that are accepted to be used in CCP3 such as the certification standards and, well integrity standards.