



**REVISED DRAFT**  
**Minutes of the Task Force on Financing CCS**  
**Beijing, China**  
**Monday, 19 September 2011**

## **LIST OF ATTENDEES**

### **Task Force Members**

Australia:	Ann Boon
Brazil:	Daniel Falcon Lins
France:	Bernard Frois (Chair)
Saudi Arabia:	Abdulmuhsen Alsunaid
United Kingdom:	Jeremy Martin, James Godber

### **CSLF Secretariat**

Jeffrey Price, Adam Wong, Matt Gebert

### **Participating Observers**

Jeff Chapman, Carbon Capture and Storage Association, United Kingdom  
Andrew Paterson, CCS Alliance, United States  
Cheryl Wilson, Bloomberg New Energy Finance, United States  
Ashok Bhargava, Asian Development Bank

### **Other Observers**

Beatriz Nassor Espinosa, Petrobras, Brazil  
Tony SurrIDGE, SANERI, South Africa  
Robert W. Gee, Gee Strategies Group, United States  
Maria Dubravka Pineda, CCS Alliance, United States  
Pamela Tomski, Entech Strategies, United States  
Logan West, World Resources Institute, United States  
Sheldon Xie, Clinton Foundation  
Lorraine Yin, The Climate Group  
Natalia Kulichenko-Lotz, World Bank

## **DISCUSSION**

Chairman Bernard Frois welcomed everyone and said that this meeting would give them the opportunity to express their thoughts on the problems with financing carbon capture and storage (CCS). Over the last two years, the Task Force on Financing CCS has been learning experts'

views on the roadblocks to financing. Dr. Frois mentioned that he also asked several knowledgeable people to make presentations in this Task Force Meeting. Those attending need to reflect on what is presented, whether we agree or disagree, and then determine what is important. Dr. Frois stated that there is much discussion of the “safety” of CCS, but he believed that safety was not the right word; rather, the correct word is “risk,” as nothing is completely safe. Therefore, the CSLF needs to continue to stimulate ideas on financing.

The attendees then introduced themselves. (See above list.)

### **Status of Task Force**

Dr. Frois reviewed the overall purpose, focus, and recent contributions of four successful roundtable workshops. Findings so far are that CCS is cost-competitive with other sources of low-carbon power and that no single incentive is sufficient. Dr. Frois pointed to Alstom’s activity on many pilot and demonstration projects as an example of activities that were taking place.

Considerable progress has been achieved on CCS over the last five years. Many organizations have analyzed financing issues related to CCS. While CCS is an expensive technology, it is needed to reach carbon emission goals while, at the same time, enabling economic development. It is important to launch CCS demonstration projects to build confidence in technology, to improve the technology, and to create an understanding of its value. The general consensus, however, is that progress is too slow. Enhanced oil recovery (EOR) may help with the financing of the first plants, but success requires change.

### Comments

Several participants gave comments on overall progress and suggestions for the future.

Jeff Chapman (United Kingdom CCS Association): The United Kingdom has reached the point where the “rubber hits the road,” and has a commitment to do four projects. The first of these is under current negotiation; the other three will be tendered toward the end of the year. The United Kingdom has a lot of projects already under development. Many good projects have already been abandoned waiting for government policy to catch up with initiatives taken by industry. We need to pay more attention to storage and have also neglected the potential development of infrastructure. With everyone working on point-to-point projects, we have neglected infrastructure plans and are pushing the United Kingdom government to come up with an infrastructure plan. In the United Kingdom, we have a very supportive government and we have a specialized office within government for CCS, which is a manifestation of the United Kingdom’s commitment to the technology. We potentially have the first-ever in the world incentive mechanism that can be used for the rollout of CCS, not just for deployment, but for moving into the future. United Kingdom published a new white paper covering proposals for electricity reform and this reform has four parts:

1. A carbon floor price at guaranteed level of £16 per tonne up to £30 per tonne in 2020 with a commitment to make that rise to £70 pounds by 2050. It is a good thing to show industry a firm carbon price, but the challenge is that to build a new coal plant you have to pay for the rest of the emissions.

2. Contracts for differences on production of carbon-free electricity. This covers nuclear, renewables, and CCS. Contracts for differences will be set at a different level for each technology, but as we proceed into the 2020s, a more level playing field will be considered.
3. A capacity payment method that recognizes that backup in standby for renewable generation will need to be provided, for example, when peak demand comes in winter. The capacity payment method has not yet been determined.
4. Emissions performance standard for new coal-fired power plants of 450 grams per kWh. The United Kingdom is the only country in the world that has proposed an incentive that will apply in stages throughout its development. The United Kingdom also has targets to reduce emissions by 2030 that are written into law.

The United Kingdom CCS Association released a study that says that, to achieve these targets by 2030, at least one-third of coal-fired power plants must have CCS. Finally, we are in a position to do EOR in the United Kingdom. It is offshore and expensive, but could potentially make a contribution.

Jeffrey Price (CSLF Secretariat): We have been talking for years about financing CCS. We know about the regulatory issues and constraints, but one of the major problems Jeff Chapman hit upon is the issue of a level playing field for CCS, but it doesn't exist anywhere. The Clinton Foundation paper for the Ministerial made that point about the need for a level playing field, but what would it look like to be level?

Jeff Chapman: There are so many factors that it's difficult to say, but at least we have recognition that CCS should be treated fairly alongside other technologies.

Jeffrey Price: Alstom just released a study in Europe with current estimates of the costs of CCS. This study shows those costs to be much lower than many people expect. Every market is different and costs will vary, but it's clear that a level playing field for CCS is critical.

Jeff Chapman: As time goes on, one matter of public perception is the cost of the technology. It is currently difficult to cost-justify industrial CCS, but the United Kingdom government's Committee on Climate Change has published some figures for the mid-2020s showing the large number of tonnes of carbon dioxide (CO<sub>2</sub>) potentially captured. We have to get the message out about how cost-effective it will be.

James Godber (United Kingdom Department of Energy and Climate Change): We commissioned a study that is on our web site so there is some government acknowledgement.

Abdulmuhsen Alsunaid (Saudi Arabia): We need to delink CCS from coal. EOR is now coming in as a chance to reduce the cost of CCS, but we need CCS as a technology in itself, not linked with another product.

Jeff Chapman: In the United Kingdom, there is a desire for one of the first CCS projects to be on a gas plant. Seven projects out of 13 projects in Europe are in the United Kingdom. That is a reflection of the positive government policy in the United Kingdom.

Abdulmuhsen Alsunaid: If you are financing a project, and you want credit from CO<sub>2</sub> storage, you want assurance that, when you go to ADB or World Bank, they accept your methodology for storage. An approved protocol for storage methodology and monitoring is needed. Financing cannot be done before those protocols are decided.

## **Andrew Paterson Presentation**

Andrew Paterson of the CCS Alliance gave a presentation on financing CCS. He said that one of the important issues is the notion of Public Private Partnerships (PPPs). In listening to approaches, a scaffolding of PPP financing structures was developed. The notion is that an evolutionary path of different PPP structures is unfolding. Canada and U.S. and others have used PPP 1.0, which is subsidized R&D and project development. PPP 2.0 combines this with regulatory reform, as in the European Union and United States with the US Environmental Protection Agency's new rules associated with long-term storage. PPP 3.0 is active negotiation on current projects, such as is taking place in the United Kingdom and also in the United States via the U.S. Department of Energy's loan guarantee program. The key element in moving to PPP 3.0 is a more sophisticated approach by the public sector that involves not just the ministry or regulator but the legislature. It may also involve capacity payments, contracts for differences, capital costs buy-downs, feed in tariffs, electricity market reform, insurance mechanisms, etc. PPP 3.0 adds these layers of sophistication which enable larger commercial-scale projects to address critical risks, not just costs, and to accommodate differences among power and energy or industrial projects.

Alternative engagement models were also described, including public utility, outsourcing, owner/financier, mixed funding, and private sector. An all-private sector financing model is not feasible at this juncture, so there has to be public funding. SASOL is a fascinating model that might be reexamined (i.e., very large plants were constructed by the government and then privatized in 1980). There are case studies in developing countries and not just developed countries.

Capital attractiveness is as important as end-use and output energy numbers. Industries as well as engineering and technology firms are doing a lot of work, not just seeking subsidies. But there are major items that the private sector cannot do. Examples were given of several projects with different models.

Société Générale has presented financing challenges as perceived from the lending community. Credit ratings and analysis are going to be determinative as to whether you get financing through debt/equity structure. Key message: no long-term clarity = no project finance. The CO<sub>2</sub> liability issues must be resolved before financial closing can take place.

## **United Kingdom Perspective on CCUS Finance Issues**

James Godber of the United Kingdom Department of Energy and Climate Change discussed the United Kingdom perspective. He made several points:

- In the context of financing, the biggest barrier is that the technology does not fit readily into a conventional category. Is it an energy technology or a climate technology? Until we decide that, there is no one focal point. Whose responsibility is it? We have established a dedicated office to promote it, but it is about bringing the rest of the department and Whitehall machinery along with you.
- High cost leads to criticism from ratepayers and stockholders.
- CCS does not lend itself to near-term poverty alleviation, so it is harder to use development budgets to support CCS.

- Risks are associated with abatement and integrity. This is important in the context of finance.
- Contract negotiations with United Kingdom demonstration projects are ongoing and we hope the negotiations to be resolved satisfactorily soon.
- Internationally, there are issues around the “ask” and the scale of funds needed. For example, if we create a \$5 billion fund, where do we spend that money? Simply making finance available isn’t going to result in anything in the near term.

### **Market Context for CCS**

Cheryl Wilson of Bloomberg New Energy Finance gave a presentation on this topic. While substantial public funds have gone to CCS projects (approximately US\$11.5 billion, 85% to demonstration projects), we should assume that the current public grant structure will not continue. In order to move beyond the first round of demonstration projects, public support will be needed, but that support will likely be in a different form. For example, liability is important for project economics. Perceived risk is real risk to potential investors. The Alberta Provincial Government in Canada has set up a fund into which anyone who injects into the ground has to contribute. What the Alberta Government has done is something that could be done in other places. Rate recovery is also becoming a make-it-or-break-it factor for power projects in the United States. Rate recovery beyond power projects should be considered; for example, Illinois recently allowed a regulated non-power project to get a higher rate of return.

Ms. Wilson stated that one of the most significant trends is toward CCS projects associated with EOR, particularly in the United States and Canada. The sale of CO<sub>2</sub> for EOR (and other byproducts as well) will be increasingly important for project economics. The oil industry wants CO<sub>2</sub>; a gap in supply of CO<sub>2</sub> exists in West Texas and could be matched with potential supply. Demand for CO<sub>2</sub> exists in some regions and is contributing to the first round of demonstration projects in the United States. EOR is also being talked about in terms of energy security in China and the United States; for example, a bipartisan effort was recently launched in the United States to create supply incentives for CO<sub>2</sub> to be used for EOR to boost domestic oil production.

### **Outlook of International Financial Institutions**

- **World Bank.** Natalia Kulichenko-Lotz presented background on expertise and activities of the World Bank in the area of CCS finance. The objective of a major World Bank effort is to build a computer model of the levelized cost of electricity (LCOE) to investigate CCS. She described the scenarios and assumptions that the World Bank is exploring using the model. The model allows for difference forms of blended financing structures. She also described the results of analyzing CCS technologies.
- **Asian Development Bank.** Ashok Bhargava discussed the Asian Development Bank’s perspectives. He stated that CCS must be properly compared to alternatives. When we say CCS is expensive, what is it expensive in relation to? This is a major problem with CCS – we have not positioned it correctly. Coal-fired power has lower costs than solar and wind.

Mr. Bhargava asked what the drivers for CCS are. He says there currently are none, as no real goals, targets, or policies now support CCS. Ultimately someone has to pay to

decarbonize electricity from coal-fired power plants. Poverty challenges mean that imposing additional energy cost burdens on developing countries is unreasonable.

The ADB believes financing CCS in developing countries is important. Strong financial support is needed if we want to build CCS projects in developing countries. Developing countries also require significant capacity building to enable them to implement CCS on a long-term basis, and it is not a climate solution for all countries.

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