

Project Developer Interviews

Regulatory measures and financial incentives to accelerate the commercial deployment of advanced coal with carbon capture and storage

September 2008

Executive Summary

The Midwestern Governors Association's Energy Security and Climate Stewardship Platform (2007) laid out measurable goals, objectives and a menu of policy options for the deployment of advanced coal with carbon capture and storage (CCS) in the MGA region. At the first meeting of the MGA Renewable Electricity and Advanced Coal and Carbon Capture Advisory Group, it was recommended by participants to interview project developers from the gasification industry to identify the top regulatory/statutory measures and financial incentives that would encourage the development of commercial scale projects. Seven interviews with project developers and industry experts were conducted from July – September 2008. This paper captures the perspectives and key points that emerged from the collective conversations.

Areas identified as top priorities include:

- The need for a climate framework so industry can adapt to the rules vs. operating in an environment of uncertainty.
- The need for a legal and regulatory framework that addresses issues related to: capture percentage; pore space ownership for CO₂ storage; mechanisms for acquiring property rights; the development of CO₂ pipelines; and liability for CO₂ storage over the long-term.
- Financial support and incentives that would specifically enable the financing of commercial advanced coal and CCS projects including tax credits that are self-executing, long-term contracts, and incentives for storing CO₂.

One of the critical issues identified is the environment of uncertainty that project developers are operating in. This is largely defined as a lack of rules for both a future climate framework and for a legal and regulatory framework for CCS. Advanced coal and CCS projects will be significantly impacted by a future climate framework and it is recognized that a climate framework is likely in the near-term. It is difficult to evaluate projects in the absence of knowing how that climate framework will be structured. Industry can adapt to rules once they exist, respond to incentives, and develop projects once they know how to evaluate the costs and benefits associated with different technology choices.

There are several regulatory and statutory issues that need to be addressed to move CCS projects forward. The top measures identified were: supporting capture at percentages that can be financed; determining pore space ownership and associated rights (surface/mineral) that need to be acquired; supporting the development of a pipeline infrastructure build-out; the applicability of eminent domain or other mechanisms for property acquisition; and determining how project liability for the long-term

stewardship of projects will be addressed (state or federal government, commercial, hybrid approach). States have the opportunity to address many of these issues through statute and regulations.

Commercialization of advanced coal technologies and CCS projects on a large scale will require a supporting infrastructure and will require support of the interim building blocks. This can be done at the state and federal level through a regulatory and statutory framework that clarifies the rules and through financial mechanisms to encourage these advanced technologies. Supporting a range of CCS projects (IGCC, SNG, CO₂ – EOR, fertilizer, and chemical) will accelerate CCS technology deployment, infrastructure build-out and increase technical and regulatory experience while reducing the costs of carbon capture and storage.

In order to support project development of these technologies, several financial mechanisms and strategies were highlighted. Financial support needs to be given to projects that are advancing these technologies and to projects that are taking the first steps towards large scale commercialization of CCS. As early CCS projects may be penalized by the financial industry, these projects can be assisted by tax credits, long-term contracts, and federal loan guarantees. In the absence of a climate framework, incentives will support companies in investing in carbon capture and storage. An effective incentive to store CO₂ would be a tax credit per metric ton of CO₂ stored. In order for tax credits to be most effective, they should be self-executing and automatic. Similar tax credits have been proposed and are being considered at the federal level.

Through addressing the issues related to how CO₂ and CO₂ storage will be treated in a future climate framework, establishing rules and regulations for CCS, and by providing the financial incentives and mechanisms to support projects, these technologies can be deployed on a scale that will achieve the goals of energy security and climate stewardship as outlined by the MGA.

Please note: The executive summary and following paper are summarized from the interviews as a whole and do not represent any specific opinion or recommendation expressed in any one interview or by the MGA.

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Capture

Capture costs need to be lowered to a level that will incentivize capture and further development of capture technologies.

Capture Percentage

To develop CCS projects, such as an IGCC plant with capture, there are interim steps that need to be supported in order to reach higher levels of capture at lower costs. Legislation that supports carbon capture projects should not only support projects that reach high levels of capture but also support projects that capture initially at a lower percentage. Even the lower percentages of capture for an IGCC plant can supply CO₂ for commercial scale storage projects – the kind of scale needed to move forward as a whole on carbon storage.

- IGCC with about 20% capture is what can be guaranteed by a vendor and what can be financed at this time.

State action

- State legislatures could implement legislation that authorizes or even requires PUCs to include the environmental externalities in least cost assessments to more accurately assess these projects.
- States can reduce the amount of risk a project is exposed to by streamlining the permitting and siting process and by providing a guaranteed rate of return on investment.

Federal action

- The federal government could propose mechanisms for lowering the capital costs that would offset the differential between cost for IGCC and PC plants.
- Many states have been proactive on supporting advanced technologies but they need further federal support.

Environment of uncertainty – unknown structure of a future climate framework

Climate legislation will likely be passed in the near-term but it is unknown how that framework will be structured. Industry needs to know what the rules of that framework will be and how CO₂ will be addressed. Industry is reluctant to move towards these advanced technologies without greater certainty on climate policy. Project developers need a basis from which to evaluate the costs and benefits and potential risks of developing different projects. Industry can adapt to rules and move forward with advanced coal and CCS projects within a defined climate framework and with the proper incentives. It will be important to structure the climate framework in a way that incentivizes the desired outcomes.

- Need to determine how a climate framework will play out in regulated and deregulated markets.
- Companies will be incentivized to capture/store more carbon if they receive credit within the GHG accounting system for emissions reductions.
- Provide bonus CO2 allowances for early moving projects. A drawback of bonus allowances is the potential for it taking a long time to put in place.

Technology deployment

There are opportunities to develop the technologies in the gasification and CCS industry that create high level products such as SNG, fertilizers, and chemicals. Reductions of capital costs and technology innovation may likely happen in these areas if they have success in getting projects developed. These industries have experience with the gasification and capture side of the equation but have less experience with long-term carbon storage. These projects could supply CO2 needed for a pipeline build-out and storage at commercial scale that would support future projects.

SNG

- SNG project developers know that there is a market for CO2 and may be able to move projects forward based on the value of their products. In addition, SNG projects can create a product with a natural gas emissions equivalent. While the cost of SNG is dependent on commodity prices, there has been movement towards developing these projects in the gasification industry.
- The gasification industry as a whole, whether it is related to SNG, IGCC, fertilizer, etc., will go forward with projects where there is a demand.

Pipelines

The willingness to develop more CO2 pipelines largely depends on the development of CO2 sources. The development of pipelines is also critical to the development of advanced coal projects with CCS.

- While building out a pipeline infrastructure for one project may be cost prohibitive, a trunk line that could support multiple projects would likely stimulate project development.

Potential scenario:

- A joint interstate pipeline has been proposed from the Midwestern states to the Gulf states. Ten to fifteen projects could hook up to such a pipeline over time and it would stimulate further development of CCS projects in the region.

State action

The regulatory process of permitting pipelines needs to be streamlined, particularly in advance of a major infrastructure build-out.

- Providing right-of-way or quick take authority for CO2 pipelines as a way of expediting rights of way acquisition would be a significant incentive for accelerating project development.
- Eminent domain applicability to CO2 pipelines would be a key mechanism to expedite pipeline build-out.

Federal action

- Clarify eligible income for Master Limited Partnerships (MLPs)
 - Many pipeline companies operate as MLPs and this lowers capital costs through the tax code in section §7704. Under this tax code, current language clearly identifies eligible income from the pipeline construction and transportation of CO2 from naturally (not industrially) occurring sources and fertilizer production byproducts.
 - There needs to be clarifying language to define the qualifying income of MLPs in Subsection (d) (1) (e) to include industrial sourced CO2 used in carbon capture, transport, and storage.
 - Similar language approved previously in the Senate Finance Committee in 2007.

Storage

There is a basic understanding and certainty on CO2 storage but there is not basic certainty on the rules that CO2 storage projects will be operating under. The main barriers are on the regulatory/statutory front.

Ownership of the pore space

- Determining the interests in the pore space between surface owners and mineral rights; applicability of eminent domain and/or other mechanisms to secure the rights needed to store the CO2.

Liability

- Determine who owns the CO2, for how long and how site stewardship and liability may be determined over the long-term.
- Liability could be addressed commercially or governmentally (at the state or federal level; a hybrid approach).
- Simple strategy: a federal company that takes ownership of the CO2.
- Government could charge an injection fee, a carbon tax, or some other mechanism to create a trust that would support the long-term stewardship of the site.

Accounting for the CO2 stored

- There must be mechanisms to account for CO2 stored on a balance sheet if there are monetary rewards for putting CO2 in the ground long-term.
- Cannot tie liability to anything that would affect the ratepayers.

State action

- States can provide clarity by statute on who would own the pore space.
- States can define the mechanisms for acquiring the necessary property/mineral rights.
- States can weigh in on potential structures for managing the long-term care and liability of storage sites.

Federal action

EPA UIC proposed rules

- Generally a good step forward to the development of rules on CO2 injection and storage.
- EOR projects should be eligible to make the transition to storage projects.
- Rules do not address pore space ownership and long-term liability.
- The post-closure period, initially set at 50 years, was not seen as a deal-breaker. The greater risk to shoulder in terms of liability from an operator's perspective is in the beginning phases of operation.
- Still need to determine who project developers will pay to store CO2.

CO2-EOR projects

Projects using CO2 for EOR potential have significant advantages: they utilize well-characterized formations; they provide revenue for the project through oil production; they have operators with CO2 injection experience; several states with CO2-EOR projects have regulatory experience; and CO2 EOR projects already occur in areas with populations accustomed to injection projects.

State action

- Important for states to pass legislation that would clarify how EOR projects can make the transition to storage projects.

Federal action

- Clarify in the EPA rules how EOR projects can make the transition to storage projects.
- Incentivize CO2 storage using anthropogenic CO2 in CO2-EOR projects.
- EOR projects should qualify as storage projects and be eligible to receive credit in a climate framework for the net CO2 that is stored, after accounting for oil recovery.

Financial drivers and incentives

There is a need for carbon capture and storage projects to be done on a larger scale to build confidence but Wall Street may penalize some first movers. Projects should be incentivized and supported in developing projects that capture and store CO₂.

- Eventually, projects that are adopting CCS will need to be rewarded while also penalizing those who don't adopt CCS or other low-carbon technologies.

Long-term contracts/agreements

- Need a long-term contract to get a project financed.
- Long-term contracts are more effective than tax credits and grants because they provide long-term support and certainty. Long-term contracts provide insurance for those taking the risk of investing - without these agreements, projects will not get financed.

Long-term contract further solidified through the legislature

- Example: Indiana passed HB 1722 that would prevent the PUC from rescinding a previously approved contract's terms.

Tax credits, grants, and incentives

- To be effective and incentivize projects, tax credits should be automatic and self-executing (more in the mold of the wind PTC).
- State tax credits are more effective than state grants because grants have to be claimed as income.
- Examples of tax credits and incentives: tax credits on necessary pieces of equipment for the capture and/or storage of CO₂, such as compression equipment or other capital costs.

Federal loan guarantees

- Federal loan guarantees can bring down the capital costs and are general means of financing gasification and CCS projects. As DOE will not give loans to projects without solid contracts, this re-emphasizes the importance of long-term contracts.
- The DOE is in the business of technology and are therefore less averse to technology risk in comparison to commercial banks.
- To be most effective, the requirements for obtaining loan guarantees should be consistent with closing the gap between the cost of the technologies the federal government is supporting and the cost that commercial banks are not ready to cover.

Incentivizing storage

- The bottom line is that there need to be incentives that cover storage cost - otherwise there is no reason at the present to store CO₂ from a business perspective.
- Best strategy – a \$/ton stored credit.
 - A tax credit of \$10/ton stored would likely be sufficient to bring the costs down to simulate the construction of pipelines from emission sources to, in the near term, EOR projects. These pipelines could provide a backbone for the long-term build-out of a CO₂ infrastructure to saline aquifers.
- This type of tax credit has been introduced in different bills in Congress (see Carbon Reduction Technology Bridge Act of 2007; Senate Finance Committee tax credit passed in 2007).

Clean Coal Power Initiative

- The CCPI has been a good source of funding. It should be focused on the technologies that really need to be moved forward (not on PC plants).

FEED studies

- States/federal government could explore ways of funding FEED studies.

Project development strategies

A structure could be created where the investor, regulator, developer, and pipeline operator would agree on the supply of CO₂, purchase of CO₂, with a long-term contract (like 30 years) at a set price for the CO₂. This could be approved by a PUC and the banks would also support it because there is a high level of long-term certainty.