



**State Clean Energy-Environment Technical Forum
Integrated Gasification Combined Cycle (IGCC) & Carbon
Capture and Storage (CCS) Part 2: Federal and State Incentives
November 9, 2006
Call Summary**

Participants: 51 participants from 18 states and several national organizations (see the participants list at <http://www.keystone.org/html/documents.html>.)

Key Issues Discussed

- Incentives for IGCC included in the Energy Policy Act of 2005
- States with current or emerging incentives for IGCC and CCS
- Public utility commissions' role in advancing IGCC and CCS

Summary of Presentations

Note: Most of the presentations from this call are available for download at <http://www.keystone.org/html/documents.html>. Please refer to these documents for additional detail on the presentations.

A. Welcome – Julie Rosenberg, U.S. Environmental Protection Agency (USEPA)

- Today's call addresses federal and state incentives to developers to advance IGCC and CCS
- States have demonstrated interest in IGCC and CCS to help them use domestic energy resources in ways that address the environmental issues that they are facing

B. Overview of IGCC Incentives in Energy Policy Act of 2005 (EPAAct) – David Berg, Policy Analyst, US Department of Energy (DOE)

- Some EPAAct Policy Goals
 - **The Clean Coal Power Initiative (CCPI)** supports large-scale demonstration IGCC plants. The plants in Wabash, Indiana and Tampa, Florida, which produce electricity for local utilities are examples.
 - EPAAct includes **research and development incentives for the conversion of Fischer-Tropsch synthesis gas to liquid fuels.**
 - **The Clean Air Coal program** encourages the development of better control technology and better gasification technology.
 - The **Coal Research Program funds research and development for coal gasification.**
- EPAAct Incentives for IGCC
 - **Investment Tax Credits** for IGCC Plants
 - IGCC projects are eligible for a 20% investment tax credit, while other advanced coal-based projects that produce electricity are eligible for a 15% credit, and industrial gasification projects are eligible for a 20% percent credit.

- Up to \$800 million can be allocated for IGCC projects, up to \$500 million can be allocated for other advanced coal-based technologies, and up to \$350 million can be allocated for industrial gasification.
 - DOE deadline for proposals to receive investment tax credits has passed, and DOE will announce which plants are eligible for the credit shortly.
 - **Federal Loan Guarantees** for Commercial IGCC Plants
 - Federal loan guarantees are authorized in two sections of EAct. DOE has elected to use its authorities under Title 17 **for projects that avoid, reduce, or sequester air pollution and use new and improved technologies**. Projects must also have a reasonable prospect of recouping the loans funds.
 - The first round of incentives will exclude petroleum refining and nuclear power. Renewable projects will exclude geothermal and hydrological power.
 - There are strict requirements for DOE to perform **due diligence before granting loan guarantees**, such as assessing the technologies used, the market for fuels or for generated electricity, etc.
 - **The limit of the loan guarantee** is 80% of the cost of the facility, although DOE is exploring the possibility of limiting guarantees to 80% of debt instead. DOE has the option of guaranteeing more than 80%, but it cannot guarantee 100%.
 - The deadline for proposals has been extended until December 31, 2006. The specifics of DOE's guidelines are available on the agency's website at <http://www.lgprogram.energy.gov/>.
- Appropriation and Authorization of Funds
 - DOE and Congress are still working out some of the details of the incentives program. Authorization in an appropriations bill is still required.
 - Funds are authorized in the 2007 appropriations bill but are not yet available.
 - EAct says that the **costs of the loan guarantee program** can be paid in two ways:
 - Appropriated funds (which are not available)
 - **The project sponsor can pay the costs** through negotiations with DOE. This is the most likely scenario, and has not deterred developers from submitting proposals for loan guarantees.
 - DOE will only award up to **\$2 billion in federal exposure** through loan guarantees, although leveraging of funds allows this to go up to **\$4 billion in actual projects supported**.
- Why Incentives Are Available
 - Federal and state governments have co-funded energy projects through grants and tax credits in the past. These are crude instruments that are not addressing any one risk. Rather, they are a direct cash subsidy.
 - **Loan guarantees are a very targeted tool that can be used to deal with a very narrow risk.**
 - Loan guarantees specifically address the demonstrated risk that IGCC plants may not reach their performance goals (operation efficiency and availability) until 2 to

- 3 years after being built. Guarantees guard against plants falling short in cash flow from sales to pay the debt, causing default and bankruptcy.
- A second advantage of loan guarantees is that they **allow federal agencies to get a lot of leverage for the money they are providing**—only 1% of the cost is a cash outlay, compared to tax credits or grants for which 100% of the cost is cash outlay.
 - Additionally, agencies only have to **put a small amount of funds away** to secure the loan, and they only have to pay the complete amount if the project fails.
- An approach suggested by Bill Rosenberg (former Michigan PUC Commissioner)
 - See paper “Deploying IGCC in this Decade with 3-Party Covenant Financing,” available at http://bcsia.ksg.harvard.edu/publication.cfm?program=CORE&ctype=book&item_id=395
 - Describes a regulatory and financing covenant that includes government load guarantees, regulatory risk mitigation through rate base approval, and assured returns to investors. It is important for states and DOE to work together to achieve these goals.

Questions for David Berg

Is biomass included as an energy supply?

Yes, it is included.

What kinds of entities benefit most from loan guarantees versus other incentives?

There are 3 categories of companies that might own power projects. Each category benefits differently from loan guarantees.

- Regulated utilities: Regulated utilities have rate-based projects and are normally very credit-worthy on Wall Street. These projects already have access to low interest rates, so they do not get as much benefit from loan guarantees as other companies might. These companies have to maintain a certain debt-equity ratio (usually 55%-45%). If they depart from this ratio on one project, they would have to rebalance their overall portfolio, which further limits the value of loan guarantees.
- Independent power producers (IPPs): Independent power producers are normally selling power into the spot market. Their projects are not rate-based, and they often have weaker balance sheets. Having a leveraged project structure is very valuable, as is the lower interest rate, so IPPs benefit most from loan guarantees. (Merchant power companies benefit from loan guarantees in a similar way.)
- Public power companies: Public power companies normally use the federal finance bank to back their debt. Since it is not possible to have federal loan guarantees for federally financed projects, public power companies are generally ineligible for loan guarantees.

C. State Legislative Role in IGCC and CCS – Kate Burke, Policy Specialist, National Conference of State Legislatures (NCSL)

- States with Existing Incentives

- Colorado: Approves the development of IGCC facilities that use Colorado or western coal upon a showing of feasibility, environmental benefits, and cost-effectiveness
- Kansas: Offers tax credits for the development of new coal gasification facilities
- Kentucky: Requires the Public Service Commission to approve certain long-term contracts by utilities for synthetic gas from coal
- Illinois: Provides up to \$300 million in bond funds for new gasification facilities and \$5 million in public-private support for the \$1.1 billion IGCC Taylorville Energy Center, among other incentives
- Indiana: Provides a variety of financial incentives for “clean coal and energy projects” using Illinois Basin coal or gas that 1) occur at new or existing facilities, and/or 2) reduce regulated air emissions from existing generating facilities
- Minnesota: Offered incentives for proposed Mesaba Energy gasification plant and entitles Excelsior Energy to sign a 450 megawatt power purchase agreement with Xcel Energy
- Ohio: Offers conduit funding, loans, loan guarantees, grants, tax incentives, and funding for demonstration projects
- Pennsylvania: Requires load-serving entities to provide 18% of their electricity using alternative sources (including IGCC) by 2020, provides low interest loans for IGCC, and permits long-term power purchase contracts to assist with funding; first state to include waste coal, coal mine methane, and other additional energy sources
- Texas: Funded site screening for potential FutureGen plant, approved \$22 million in grants and incentives for low-emission projects, and expedited permitting for FutureGen-type projects
- Wyoming: Offers a sales and use tax exemption for equipment purchased to make new IGCC or coal liquefaction facilities operational
- States with Emerging Incentives
 - Mississippi: Bond issue for gasification died in committee in March
 - New Mexico: Tax credit for IGCC, fuel cells, and renewables died in committee
 - Virginia and West Virginia: Exploring a clean coal technology research fund to finance research
- For more information, please visit the NSCL website (www.nscl.org), which has links to all state legislation.

Questions for Kate Burke

Do some states encourage use of indigenous coal?

Yes, many states do this. The use of IGCC as an economic development mechanism is one reason why the major coal-resource states are now looking at incentives for IGCC and CCS.

D. State Public Utilities Commission (PUC) Role in IGCC and CCS – Jim Welch, Director of Engineering, Kentucky Public Service Commission (PSC)

- **The Kentucky Regulatory Environment**
 - Includes 4 investor-owned utilities, 19 rural electric cooperatives that are not supplied by the Tennessee Valley Authority (TVA), 5 TVA cooperatives, and several merchant power plants.

- Kentucky consumes 100,000,000 megawatt hours per year, of which 92% is generated from coal steam.
- 21,701 megawatts are generated within Kentucky, of which 13,801 megawatts are from coal-fired generation (although not from IGCC, which does not yet exist in Kentucky)
- **Kentucky PSC Interaction with IGCC and CCS**
 - Siting for merchant plants
 - Certification of Public Convenience and Necessity (CPCN), by which the PSC determines if a utility project is necessary and serving the public convenience
 - Cost recovery
 - Carbon dioxide pipeline safety
- Questions to Be Answered Prior to PSC Approval of IGCC
 - **How do capital costs and overall benefits increase** for IGCC compared to pulverized coal?
 - How is the **cost of carbon dioxide storage** justified?
 - How do you match the **diffuse benefits of IGCC** with the **concentrated costs to rate payers**? Having rate payers serve as the primary source of cost recovery is a major hurdle for IGCC to overcome.
 - Which **externalities** can/should the PSC consider? This is particularly important given that the Kentucky PSC does not review environmental considerations in siting decisions—the Air Quality Division of the state Environmental Protection Agency does this.
 - How well do the decision makers, participants, and reviewing courts **understand the technology**? People in the industry are more accustomed to talking about pulverized coal and may need to be educated about these newer technologies.
- Potential Ways to **Simplify the Approval Process**
 - Legislative changes could simplify the cost-benefit analysis by **defining the cost of carbon dioxide emissions or the benefit of carbon dioxide sequestration**.
 - **Capital costs could be reduced** through grants and loan guarantees to make costs of IGCC more comparable to the costs of pulverized coal.
 - Legislative changes could **allow for cost recovery** of IGCC or CCS investment.
 - Regulatory agencies could actively participate in IGCC and CCS **education and workshops**.
- Activities in Kentucky that Encourage Coal Gasification
 - **Long-term purchase contracts** for synthetic natural gas to be considered prudent by law
 - Legislation directing state to develop strategies and propose **legislation to encourage the development of coal-to-liquids projects**
 - Kentucky **FutureGen** application, which made it to the Final 10
- Additional Concerns about the **Carbon-Constrained World**
 - How will existing generation plants be affected?
 - Will retrofitting of existing facilities be feasible?
 - What is the cost impact?
 - How will it affect fuel source decisions?

Questions for Jim Welch

Has any research been done on how to quantify benefits of CCS?

Emission reductions can be quantified, but it is not clear if anyone is working on the financial benefits of CCS.

How can the cost recovery for IGCC be justified when compared to pulverized coal?

Cost is not the only criteria for approval of projects. If a different technology has a higher cost, we can still approve it based on other criteria, like its reliability record.

What aspects of the permitting and siting process are unique for IGCC and CCS? (Diane Andrews from the Kentucky Air Quality Division responded to this question.)

The Air Quality Division is in the process of evaluating a merchant plant IGCC proposal now, although it is not considering CCS or deep-well injection in that process. The permitting and siting process is not unique for IGCC; the Division is just following the standard permitting process. The applicant has proposed using selective catalytic reduction to control nitrogen oxides.

General Questions (Answered by Various Participants on the Call)

What is the carbon dioxide emission rate of coal-fired generation?

It depends on the technology and the efficiency. There is more information on this in the summary from our last call on IGCC technology, which is available at <http://www.keystone.org/html/documents.htm>.

What role does IGCC have in the state energy plans?

The California Energy Commission recently issued an integrated energy policy report that has a general statement about preferring low emissions for new generation. A new California bill will prohibit long-term greenhouse gas sources. When the state is preparing an emission performance standard, IGCC should be under the threshold, whereas pulverized coal would need to use carbon sequestration to get there. California is part of the West Coast Regional Carbon Sequestration Partnership (WESTCARB), which is working on determining the capabilities of carbon sequestration. Additionally, there are projects under way in California that will shed light on the ability to do IGCC and CCS in the state.

What is the status of the FutureGen process?

The list of candidates has been reduced to four sites (2 in Illinois and 2 in Texas). DOE will provide \$750 millions for a \$1 billion plant in one of these places.

<p>NEXT CALL: December 14, 2006, to discuss Energy Efficiency Opportunities in Low-income Housing</p>
--