

Policy Working Group

Advanced Coal Task Force Western Governors' Association

At the request of the Advanced Coal Task Force, these reports were submitted for the consideration by the task force in crafting their recommendations. The reports do not represent the adopted position of, or an endorsement by, the task force. Contributors to the reports are listed below. Participation as a contributor does not imply any endorsement of the specific elements of the report, or endorsement of the report as a whole.

Clean Coal Policy Working Group Prioritized Recommendations

Existing Barriers to Deployment

Barrier: *Cost of electricity from an advanced clean coal facility is higher than from new conventional coal technologies or existing coal plants.* These higher costs are primarily due to:

- **risks associated with developing and operating facilities incorporating new technologies that lack a long-term operational track record, and**
- **higher initial capital costs associated with these more advanced technologies.**

Advanced coal technologies are currently more expensive than traditional coal technologies, primarily due to construction and operation uncertainties, (i.e. risk). Since only a few advanced coal plants have been built and have a limited operational track record, financing for these projects is both more difficult to obtain and more costly once obtained. Investors are concerned that the facility: 1) won't be able to generate the expected gigawatt-hours/year to provide the required revenue, 2) power production costs will be higher than estimated, reducing the profit margin, or 3) the facility will not operate at expected performance levels. Essentially a financing "price premium" (higher interest rate, higher expected rate of return, etc.) is, therefore, expected by and is paid to the equity and/or debt investor to compensate for this added risk. This ultimately translates into a higher levelized cost of energy (LCOE, in cents/kwh) for the advanced coal facility. In the case of IGCC, the risk is heightened since much of the West is at 4000 feet in elevation and above, and the facility would likely use lower rank (BTU content) western coal – heightening design and operational challenges. Existing IGCC plants operate at low elevation using higher rank coal.

Another reason for advanced coal technologies' higher costs is simply that the capital costs of a more technically advanced facility are higher than for traditional facilities. This is especially true for the first few facilities constructed.

Many of the policy recommendations listed below focus on having the federal and/or state government provide incentives that assume a portion of the risk thereby reducing the LCOE. Other solutions act in essence to "buy down" the cost of the facility to account for the higher upfront capital costs.

Barrier: *Socially desirable characteristics of IGCC and other advanced clean coal technologies (e.g. lower emissions of criteria air pollutants and toxic air pollutants, lower carbon dioxide emissions, ability to capture carbon, less solid waste, lower water use, ability to mitigate financial risks of future environmental regulations, especially the possibility of CO₂ constraints) are not fully rewarded" (i.e. accounted for) in current electricity markets.*

Resolution and clarity in the policies affecting power generation that seek to encourage these socially desirable characteristics will have a significant impact on investments in IGCC and other advanced clean coal technologies. The current environment of policy uncertainty facing advanced coal technologies with respect to future emissions regulation, but also uncertainties regarding the status of deregulation for future power generation is a barrier to investments in advanced coal technologies.

IGCC-Specific Barrier: Uncertainties about IGCC performance/incremental costs when using low-rank western coals and when operating at higher elevations

IGCC power plants that are now in operation generally use coals with a high heating (Btu) value and/or petroleum coke as the feedstock and operate at low elevation. The cost and reliability issues, along with the technology uncertainties and risks, are significantly increased with use of lower-rank western coals. IGCC plant efficiencies are also lower at the higher altitudes characteristic of many western power plant sites.

Policy Recommendations

As a means to overcome the barriers discussed above, the CCTF has developed a set of prioritized recommendations divided between those at the federal level and those that the WGA Governors should pursue in their own states.

It's important to note that the recommended incentives can be viewed as short to medium term "bridging incentives" rather than needed on a long term or on-going basis. As market deployment proceeds, technical and operational risks will eventually be substantially eliminated and projected cost reductions will be realized (through economies of scale, competition, operational improvements, more favorable financing, etc.). At some point, the technologies will achieve cost-competitiveness on their own and will likely no longer require most if not all of the bridging incentives. In other words, once the technology has crossed the "bridge" (by achieving substantial market deployment and cost-competitiveness), the incentives can be removed.

The CCTF was clear that only those advanced coal technologies that are not already penetrating the market merit receiving the incentives. Given that most of the incentives create a revenue impact to the federal and states' budgets, it makes little sense to offer incentives to technologies that are already being deployed without them. Given that it was not the charge of the CCTF to define "clean coal" technologies, the TF did not attempt to identify which advanced coal technologies (super critical, ultra supercritical, circulating fluidized bed, IGCC, IGCC with polygeneration, etc.) merit receiving the incentives. The CCTF felt strongly, though, that only "pioneer" or "state of the art" projects should receive the incentives.

Recommendations at Federal Level:

Implementing these recommendations would involve the WGA, as a body, and the WGA Governors, individually, working with their Congressional delegations to enact clean coal

incentives legislation and making sure the incentives are implemented aggressively once adopted.

On August 8th, the 2005 federal energy policy act was signed into law. Fortunately, the legislation includes a number of substantive incentives for clean coal technologies – incentives that the CCTF had been developing during its deliberations. While there are additional incentives that could be pursued at the federal level, the CCTF felt that the most effective approach would be to focus on ensuring aggressive promotion and utilization of the adopted incentives in the legislation. This would involve a concerted effort of: the USDOE, federal Congressional offices, WGA/WIEB, state energy offices, state utility commissions, advanced coal project financiers and developers, independent power producers, utilities, etc.

The clean coal-related provisions of the federal energy bill are outlined below:

- **Title XVII Incentives for Innovative Technologies – Loan Guarantees:** Establishes a loan guarantee program to provide up to 80% federal loan guarantees to gasification and other eligible technologies. Requires eligible IGCC projects to meet certain emissions performance criteria, have an assured revenue stream to cover project capital and operating costs that is approved by the Secretary of Energy and relevant state PUC, and be designed to accommodate carbon capture equipment. Included in the provisions is the option for the project owner to pay for the federal cost of scoring their loan guarantee, which will enable the program to provide guarantees even in the absence of appropriations. The legislation establishes no cap on the amount of loan guarantees.
- • **Title XII Tax Credits – Investment Tax Credit:** Creates investment tax credits (ITC) for IGCC, industrial gasification, and advanced combustion facilities. IGCC projects may receive a 20 percent ITC and the program may provide up to \$800 million of credits. Industrial gasification projects may receive a 20% ITC and the program may provide up to \$350 million of credits. Other advanced coal-based projects may receive a 15 percent ITC and the program may provide up to \$500 million of credits. All projects must be certified by the Secretary of Treasury in consultation with the Secretary of Energy.
- **Title XXXI Clean Air Coal Program:** Authorizes \$2.5 billion for a grant program to assist commercial deployment of advanced coal technologies, including gasification, through loans, cost sharing, or cooperative agreements.
- **Title IV Subtitle A Clean Coal Power Initiative:** Authorizes \$200 million per year from 2006 to 2014 for a federal government cost share grant program to demonstrate commercial-scale applications of advanced clean coal technologies, including gasification-based technologies.

Implementation of 2005 Federal Energy Bill

The WGA and the Western congressional delegation should guide implementation of the Act's provisions to ensure maximum benefit to WGA policy goals. The Act authorizes a variety of programs to support clean coal projects, such as increased R&D funding, demonstration and commercialization incentives in the form of grants and loan guarantees, but these funds will not be available unless funds authorized in the bill are appropriated. In particular, Western policy makers should ensure that the provisions calling for research-related demonstration projects utilizing sub-bituminous western coal at the higher elevations typical of the intermountain west receive full funding. Similarly, engaging in program implementation can direct research to issues surrounding Western clean coal technologies and help Western technology developers take advantage of tax credit resources before the funding limit is reached. WGA could and should play a leading role in this effort – for instance, by organizing forums/workshops around the new legislation, involving all relevant stakeholders.

Recommendations at State Level:

These recommendations involve the WGA governors working within their states to get the measures adopted in statute and/or as a utility commission rule or policy. In some instances, utility commission support for the policies will be key in whether they are adopted. Some measures may be more effective than others in any given state; and, of course, adopting some measures may be more politically feasible in some states, than others. To the extent that states coordinate their incentives, this will help foster a more consistent project development environment across state boundaries. Multi-state utility “consortiums” in clean coal project development, could take advantage of lower overall costs through economies of scale. WGA/WIEB could play a role in facilitating such a consortium.

As with the federal recommendations, only those technologies demonstrating superior environmental performance and not already experiencing market deployment, merit receiving the incentives.

- **Allow full-cost recovery:** Utilities showing initiative to develop advanced technology clean coal power plants, should be ensured full and timely cost recovery, including for construction work in progress (CWIP), for the added initial costs. This is an area where the WGA governors can have significant influence with their utility commissions, because advanced technology clean coal’s higher initial costs may help to keep costs lower over the long-term in the presence of future, more stringent, emissions limits. Earlier this year, a state PUC rejected full-cost recovery for a utility’s IGCC facility proposal due to its higher costs.
- **Encourage appropriate “pass through” cost of purchased power acquired if the advanced technology clean coal plant is unable to deliver anticipated megawatt-hours.** This recommendation specifically mitigates operational risks.

- **Allow higher rate of return for initial advanced technology clean coal plants:** For regulated utilities, direct state PUCs to allow higher rates of return on advanced technology clean coal investments as partial compensation for the added technology risks. Some state PUCs have already granted utilities higher rates of return for certain facilities achieving “above and beyond” emissions controls.
- **Adopt Integrated Resource Planning policies:** Adopt well-designed IRP rules to weigh the full costs, benefits and risk properties of various resource options. Risks that should be considered include fuel price risk, the risk of future carbon constraints, future emission limits of criteria pollutants and mercury, and future resource technology risks. For more detail and information related to carbon policy recommendations, please see the Carbon Management Working Group Report for further detail regarding carbon policies.
- **Consider Market-based Environmental Regulatory Programs:** Market-based environmental regulatory programs that limit emissions can provide economic incentives to invest in lower emitting power generating technologies and provide owners of emitting sources with flexibility and certainty on how emission reductions are achieved. The Governors should consider whether and to what extent market-based programs can be used as an alternative to or in conjunction with command-and-control programs to provide incentives to invest in cleaner generating sources. In evaluating market-based programs, the Governors should consider the unique geography, economy, and natural environment in the West and whether any changes to existing Clean Air Act programs would be necessary to make the programs effective.
- **Direct Financial Incentives – Tax Credits, Loan Guarantees, etc.:** The same or similar financial incentives mentioned under the federal recommendations could be utilized at the state level. Obviously, a state’s budget situation (including its relative size) and competition with other non-energy related tax incentive proposals would affect the likelihood of adopting the incentives in a given state.

IGCC Polygeneration – A Special Consideration

Research suggests that the most-cost effective IGCC project may be one that combines electrical generation with the production of syngas and/or marketable chemicals. In essence, two gasifiers are utilized – normally one for electricity generation and the other for fuel and/or chemical production. If the gasifier for electricity fails or is taken down for maintenance, the fuel gasifier could be used for electricity. A second gasifier would likely significantly increase an IGCC facility’s capacity factor and reliability – making it ultimately capable of being a base-load plant as with more traditional coal plants. Since electric utilities are not in the fuels business and the fuels and chemicals industries are generally not in the electricity business, polygeneration deployment has its own unique barriers to overcome. Pursuing polygen will require a concerted effort to address such facilities appropriately with respect to regulations and/or incentives due to their multiple functions. The CCTF feels that polygen offers significant promise and that more investigation into this area is merited.