

Clean and Diversified Energy Initiative



WESTERN GOVERNORS' ASSOCIATION



Advanced Coal Task Force Report

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Western Governors' Association Clean and Diversified Energy Initiative

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The Western Governors' Association's Clean and Diversified Energy Advisory Committee (CDEAC) commissioned this task force report in February 2005. Members of the Task Force are listed below. This is one of several task force reports presented to the CDEAC on December 8, 2005 and accepted for further consideration as the CDEAC develops recommendations for the Governors. While this task force report represents the consensus views of the members, it does not represent the adopted policy of WGA or the CDEAC. At their Annual Meeting in June, 2006, Western Governors will consider and adopt a broad range of recommendations for increasing the development of clean and diverse energy, improving the efficient use of energy and ensuring adequate transmission. The CDEAC commends the Task Force for its thorough analysis and thoughtful recommendations.

Members of the Advanced Coal Task Force

Bill Keese (Co-chair)	Former Chairman of the California Energy Commission (CDEAC member)
Bill Real (Co-chair)	PNM (CDEAC member)
Phil Amick	Conoco-Phillips
Roger Ballentine	IGCC Coalition
John Barth	Western Clean Energy Campaign
Tom Bechtel	National Commission on Energy Policy
Jeff Burgess	Lignite Vision 21
James Childress	Gasification Technologies Council
John Corra	Wyoming Department of Environmental Quality
Joe Desmond	California Energy Commission
Shannon Eddy	California Public Utility Commission
Bill Edmonds	PacifiCorp
Alan Edwards	Basin Electric (CDEAC member)
Steve Ellenbecker	Wyoming Governor's Office
Dennis Ellis	Colorado Governor's Office
Sandra Ely	New Mexico Air Bureau
Ned Farquhar	New Mexico Governor's Office
Ross Fava	Shell
Jack Gerard	National Mining Association
Judi Greenwald	Pew Center on Global Climate Change
George Guthrie	Los Alamos National Laboratory
Bill Jayne	General Electric (CDEAC member)

Bob Harms	North Dakota Governor's Office
David Hawkins	Natural Resources Defense Council
Ray Hobbs	Arizona Public Service Co.
Rob Hurlless	Wyoming Governor's Office
Tom Kaiserski	Montana Governor's Office
Robert Kelly	Medicine Bow Power
Dave Lewin	EPCOR Utilities Inc.
Ben Luce	Coalition for Clean Affordable Energy
Sasha Mackler	National Commission on Energy Policy
Ron Miller	Alaska Energy Authority
John Nielsen	Western Resource Advocates (CDEAC member)
Craig O'Hare	New Mexico Energy and Minerals
Steve Owens/Ira Domskey	Arizona Department of Environmental Quality (CDEAC member)
Vickie Patton	Environmental Defense
Bob Pearson	CH2M Hill
Frank Prager	Xcel Energy
Terry Ross	Center for Energy and Economic Development
Greg Schaefer	Arch Coal
Lynn Schloesser	Eastman-Chemical
Dallas Scholes	Kennecott
Dale Simbeck	SFA Pacific, Inc.
Jim Sims	Western Business Roundtable
David Steele	West Associates
John Thompson	Clean Air Task Force
Howard Useem	The Lundquist Group
Jerry Vaninetti	Trans-Elect
Mike Walker	Harvard University
Kent Wanninger	Midwest Generation
Ed Werner	CANDO
Ernie Wessman	PacifiCorp
John Wooten/Kelly Mader	Peabody Energy

Facilitator

Kathleen Rutherford	The Keystone Center
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Quantitative Working Group

The quantitative working group was created by the CDEAC to compare the analysis of data among task forces in order to ensure consistency in assumptions across the reports.

The following members contributed to this report:

Doug Arent	National Renewable Energy Laboratory
John Tschirhart	Department of Economics, University of Wyoming
Dick Watson	Quantitative Working Group

The Western Governors' Association created the Clean and Diversified Energy Advisory Committee (CDEAC) to provide recommendations on how the region can best achieve the goals of developing 30,000 MW of clean energy in the West by 2015 from resources such as solar, wind, geothermal, biomass, advanced coal technologies and advanced natural gas, and increasing the efficiency of energy use by 20 percent by 2020. To accomplish these goals, the CDEAC created a number of Task Forces to study various clean and diversified energy technologies that could be deployed. The Advanced Coal Task Force (ACTF) is one of these task forces. The ACTF formed three work groups: the Technologies, Carbon Management, and Policy. Each work group prepared a report of its findings to the ACTF and using the information contained in the reports the ACTF arrived at the consensus recommendations contained in this document.

The Technology Work Group Report provides information on the cost, performance and environmental characteristics of the commercially available and advanced coal-fired electrical generation technologies, such as supercritical and ultra supercritical pulverized coal, supercritical circulating fluidized bed combustion technologies, integrated gasification combined cycle technologies and poly-generation technologies for the co-production of electricity, fuels and chemicals. The cost and performance of each of these technologies was assessed both with and without carbon capture. The Carbon Management Work Group Report discusses methods to store – or “sequester” – the carbon captured from power plant emissions, sequestration opportunities in the West, the current barriers to carbon management, and the options available to Western states for enabling the management of captured carbon. The Policy Workgroup Report focuses on the barriers that have inhibited the deployment of new, cleaner advanced coal technologies, and presents recommendations to overcome these barriers.

After extensive discussions, the Advanced Coal Task Force has reached the following consensus positions.

A. Support for continuing efforts to improve the efficiency and environmental performance of all advanced coal technologies examined by the Task Force.

As described above, the Technology Work Group examined the costs, performance and environmental characteristics of a variety of commercially available and emerging advanced coal-fired electrical generation technologies. The Technology Work Group report shows that the advanced technologies examined in the report typically demonstrate higher performance levels and lower emissions of criteria pollutants, toxic pollutants and CO₂ emissions than do new subcritical designs, as well as the current fleet of pulverized coal plants now in operation. The task force supports continuing efforts to improve the operational and environmental performance of all of the advanced coal technologies listed in the Technology Report, beyond current performance levels, with the ultimate goal of achieving near zero emissions of all emissions at a competitive cost of electricity.

B. Support incentives for the development of advanced coal technologies that are not yet commercially viable and operate with superior environmental performance

The emerging nature of advanced coal technologies presents challenges that must be addressed if these technologies are to be adopted and their environmental benefits realized. As discussed in the Policy Work Group Report, the higher capital and operating costs as well as the operational risks of advanced coal technologies result in a higher cost of energy, at this point in their development, as compared to conventional coal generation. Thus, incentives are needed to overcome this cost/risk challenge for an initial set of plants that will drive full technology commercialization and ultimately reduce the costs of advanced technologies.

The ACTF recommends that state-level incentives should be directed only to certain advanced coal technologies in two “Tiers.” The ACTF recognizes that the process for approving the incentives for specific projects will be through existing state-level legislative and regulatory proceedings, and that these will be subject to full participation by interested stakeholders and the public.

Tier I

The ACTF recommends that Western Governors and the Western states place the highest priority on providing incentives to facilitate the development of four to five electricity generating plants (approximately 2,000 MW total) that use coal for fuel and that capture and sequester at least 60% of their CO₂ emissions. The ACTF recommends that a full set of state-level incentives be provided to Tier I projects.

Tier II

In addition, the ACTF recommends that a subset of state incentives be provided to projects (approximately 3,000 MW total) employing technologies not yet commercially deployed in the West that most cost-effectively and rapidly move toward zero emissions and carbon capture and sequestration. These technologies could include, but are not limited to, gasification, ultra supercritical coal and oxy-combustion.

Tier I and Tier II Incentives:

Incentives available for Tier I and II projects should include the following:

Development

- Direct state PUCs to allow utility recovery of costs for Tier I and Tier II project development studies.
- Direct state PUCs to allow utility recovery of costs for studies of the sequestration potential of existing and potential plant sites.

Siting/Permitting

- Provide expedited permitting for Tier I and Tier II projects, while maintaining full public participation and the protection of human health and the environment, including consideration of the full range of impacts of associated infrastructure.
- Direct the relevant state agencies to evaluate and, if appropriate, considering other relevant siting factors, facilitate the siting of Tier I and Tier II projects in proximity to geologic sequestration, CO₂ transportation infrastructure, or opportunities to use CO₂ in economically beneficial activities.

Cost Recovery Certainty

- Allow resource pre-approval and full cost recovery. To address the higher costs and operational risks of Tier I and Tier II projects, utilities developing such projects should be ensured full and timely cost recovery provided they take appropriate steps to manage costs and risks. Regulators should also consider additional cost recovery incentives to address the higher costs of financing the construction of Tier I and Tier II projects.
- Utility power purchase agreements (PPAs) with an independent power producer to develop Tier I or Tier II projects should also be allowed pre-approval and full cost recovery, provided appropriate steps are taken to manage costs and risks.
- Adopt Integrated Resource Planning rules that recognize the full benefits of Tier I and Tier II projects.
- Direct PUCs to provide for cost recovery for participating in sequestration demonstration projects or geological assessments designed to facilitate the siting of Tier I and Tier II projects.

Performance

- Encourage appropriate “pass through” of purchase power costs or, in the case of gasification plants, replacement combustion turbine fuel necessary, if a Tier I or Tier II project does not deliver anticipated electrical generation availability.

Research

- Direct the relevant state agencies to conduct or support assessments to identify sites for Tier I and Tier II projects with access to geological sequestration opportunities, CO₂ transportation infrastructure, or opportunities to use CO₂ in economically beneficial activities.

Tier I Incentives:

In addition to the incentives outlined above, Tier I projects should be provided the additional incentives listed below. Tier I incentives would be available to Tier II projects that undergo modification to qualify as Tier I facilities. It is the ACTF’s belief that the development of Tier I facilities in the West offers the best opportunity to move toward the ultimate goal of near zero emissions for new coal-fired generation. To the extent that there is a conflict due to limited resources for providing incentives to Tier I or Tier II projects, the ATCF believes that Tier I resources should be given priority.

Financial Incentives

- Provide direct financial incentives, such as investment tax credits, loan guarantees, etc., to Tier I projects. The same or similar financial incentives in the Federal Energy Policy Act could be utilized at the state level for Tier I projects.
- Direct state PUCs to allow higher rates of return for Tier I projects.
- Provide direct payments, subsidies, or tax credits on a dollar per ton basis for CO₂ sequestered from a Tier I facility.
- Use a portion of state severance (excise), property (ad valorem), and sales taxes, or provide royalty relief, to provide financial incentives for encouraging the use of

CO₂ captured from Tier I projects in enhanced oil recovery projects (EOR) or other economically beneficial use of captured CO₂.

- Establish loan guarantees or bond funds to assist with CO₂ capture, compression and transportation infrastructure necessary for Tier I projects.

Regulatory

- Have relevant state agencies develop CO₂ storage regulations for Tier I projects that protect public health and the environment without putting unnecessary roadblocks in the way of the implementation of Tier I projects.
- Direct relevant state agencies to develop and implement protocols to account for and monitor the fate of sequestered CO₂ (including leakage) from Tier I projects.
- Authorize new positions within the appropriate state regulatory agencies responsible for the oversight and monitoring (including leakage) of EOR and other sequestration activities associated with Tier I projects.

Research

- Fund pilot programs for geologic sequestration in a variety of formations, including technology research, development and demonstration; monitoring the fate of sequestered CO₂ (including leakage); and evaluating environmental and public health and safety impacts to gather information to help site and successfully develop Tier I projects.

Education/Outreach

- Fund education and outreach programs to inform stakeholders and the public of the issues involved in sequestration from Tier I projects.
- Fund education and outreach programs to reverse the current perception of limited career opportunities within the energy and regulatory fields related to EOR and other sequestration activities. Encourage/support educational programs at the collegiate level, focused on internships, and/or field experience with knowledgeable practitioners.

Coordination of state-level incentives

Some measures may be more effective than others in any given state; and adopting some measures may be more politically feasible in some states than in others. To the extent that states coordinate their incentives, they will be able to foster a more consistent project development environment across state boundaries. Such consistency will allow multi-state utility “consortiums” in advanced coal project development to take advantage of lower overall costs through economies of scale. WGA/WIEB could play a role in facilitating such a consortium and providing a consistent policy environment.