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The Energy Challenge

2 Industry Leaders Bet on Coal but Split on Cleaner Approach

By [SIMON ROMERO](#)

WRIGHT, Wyo. — More than a century ago a blustery Wyoming politician named Fenimore Chatterton boasted that his state alone had enough coal to "weld every tie that binds, drive every wheel, change the North Pole into a tropical region, or smelt all hell!"

His words seem prophetic.

The future for American energy users is playing out in coal-rich areas like northeastern Wyoming, where dump trucks and bulldozers swarm around 80-foot-thick seams at a [Peabody Energy](#) strip mine here, one of the largest in the world.

Coal, the nation's favorite fuel in much of the 19th century and early 20th century, could become so again in the 21st. The United States has enough to last at least two centuries at current use rates — reserves far greater than those of oil or natural gas. And for all the public interest in alternatives like wind and solar power, or ethanol from the heartland, coal will play a far bigger role.

But the conventional process for burning coal in power plants has one huge drawback: it is one of the largest manmade sources of the gases responsible for [global warming](#).

Many scientists say that sharply reducing emissions of these gases could make more difference in slowing climate change than any other move worldwide. And they point out that American companies are best positioned to set an example for other nations in adopting a new technique that could limit the environmental impact of the more than 1,000 coal-fired power projects on drawing boards around the world.

It is on this issue, however, that executives of some of the most important companies in the coal business diverge. Their disagreement is crucial in the debate over how to satisfy Americans' energy appetite without accelerating climate change.

One of those executives, Michael G. Morris, runs American Electric Power, the nation's largest coal consumer and biggest producer of heat-trapping carbon dioxide emissions from its existing plants. He is spearheading a small movement within the industry to embrace the new technology. His company plans to build at least two 600-megawatt plants, in Ohio and West Virginia, at an estimated cost of as much as \$1.3 billion each.

The company says these plants are not only better for the environment but also in the best interests of even its cost-conscious shareholders. While they would cost 15 to 20 percent more to build, Mr. Morris says they would be far less expensive to retrofit with the equipment needed to move carbon dioxide deep underground, instead of releasing it to the sky, if limits are placed on emissions of global warming gases.

"Leave the science alone for a minute," Mr. Morris said in an interview at the Columbus, Ohio, headquarters of his company. "The politics around climate issues are very real. That's why we need to move on this now."

But most in the industry are not making that bet. Among them is Gregory H. Boyce, chief executive of Peabody Energy, the largest private-sector coal producer in the world thanks in part to its growing operations here in Wyoming and with aspirations to operate coal-fired plants of its own. Mr. Boyce's company alone controls reserves with more energy potential than the oil and gas reserves of [Exxon Mobil](#).

"We're still not convinced that the technology or cost structure is there to justify going down a path where we're not comfortable," Mr. Boyce said.

Mr. Boyce's view has prevailed. No more than a dozen of the 140 new coal-fired power plants planned in the United States expect to use the new approach.

The decisions being made right now in industry and government on how quickly to adopt any new but more costly technologies will be monumental.

"Coal isn't going away, so you have to think ahead," said Gavin A. Schmidt, a climate modeler at the Goddard Institute for Space Studies, part of [NASA](#). "Many of these power stations are built to last 50 years."

Promise and Perils

Michael Morris and Gregory Boyce, both kingpins in their industries, have a lot in common. They do a lot of business together — Mr. Morris is one of Mr. Boyce's largest customers. They are solid Republicans. And they serve together on various industry initiatives.

They agree that energy from coal — the nation's most important source of electricity — is cheaper than energy from oil and natural gas and is competitive with the uranium used in nuclear power plants. And coal could serve new uses: replacing petroleum in making chemicals, for example, or even fueling vehicles.

But while sooty smokestacks are no longer a big problem in modern coal-burning power plants, the increase in global warming gases is. A typical 500-megawatt coal-fired electricity plant, supplying enough power to run roughly 500,000 homes, alone produces as much in emissions annually as about 750,000 cars, according to estimates from [Royal Dutch Shell](#).

Coal has no stronger evangelist than Mr. Boyce, who grew up on Long Island, the son of a mining executive, and studied engineering in Arizona. He argues that a way to reduce carbon dioxide emissions can be found without having to switch from the existing cheaper coal-burning technology.

Much in the way that Exxon Mobil influences discussion of climate issues in the oil industry, Peabody is a backer of industry-supported organizations that seek to prevent mandatory reductions in global warming emissions and promote demand for coal.

Peabody's executives are also by far the coal industry's largest political contributors to federal candidates and parties, giving \$641,059 in the 2004 election cycle, with 93 percent of that amount going to Republicans, according to the Center for Responsive Politics, an independent research group in Washington that tracks money in politics. And while Peabody says it expects contributions to Democrats to increase, under Mr. Boyce the company has cultivated close contact with the Bush administration.

Mr. Boyce was chairman of an advisory panel for the Energy Department, organized by the [National Coal Council](#), that produced a controversial report in March calling for exemptions to the Clean Air Act to encourage greater consumption of coal through 2025. The thrust of the report, which Mr. Boyce outlined in an interview, is that improvements in technology to limit carbon dioxide emissions should be left to the market instead of government regulation.

By contrast, the environmental advocacy group Natural Resources Defense Council, which has brought many lawsuits aimed at controlling pollution, described the report as an "energy fantasy" that would increase carbon dioxide emissions by more than 2 billion tons a year.

But it is Peabody's economic argument, not the environmental opposition's, that is resonating throughout the electricity industry and among energy regulators.

Led by Peabody, dozens of energy companies have embarked on the most ambitious construction of coal-fired electricity plants since the 1950's.

Coal, as Mr. Boyce notes, is a bargain. Despite a doubling in domestic prices in the last two years, a surge in prices for natural gas, the preferred fuel for new power plants in the 1990's, has made coal more

attractive.

With coal so favorably priced, Peabody saw an opportunity to enter the power-plant business itself, setting out to build two of the largest in the world, the 1,500-megawatt Prairie State Energy Campus in southern Illinois and the 1,500-megawatt Thoroughbred Energy Campus in western Kentucky. Both are in areas where the St. Louis-based company has substantial coal reserves.

Despite concern among some large energy companies over the liabilities they face if global warming advances or legal limits on emissions become a reality, Peabody remains loyal to its technology choice. Vic Svec, Peabody's senior vice president for investor relations, said the possibility of near-term caps on carbon emissions was not viewed as a "material threat."

Mr. Morris, at American Electric Power, sees things differently. He cites cost concerns in arguing for its move to cleaner technology. At the request of environmental groups that hold shares in the company, A. E.P. agreed in 2004, shortly after Mr. Morris arrived, to report on the potential costs it would face if emissions rules were tightened. The company recognized that its growth beyond 2010 could be limited if it stuck with old technology.

The company has since won important allies in its push for cleaner coal, including [General Electric](#), which is pinning much of its hopes for growth in the electricity industry on new technology and is working with A.E.P. on designing its plants.

One vital element of A.E.P.'s ambitions, and by extension those of other energy companies with similar projects, fell into place in April when the Public Utilities Commission of Ohio allowed the company to bill customers for a portion of the higher pre-construction costs for the plant it is planning in the state. The company hopes to complete construction of its first such plant by 2010.

Proponents of these plants, which turn coal into a gas that is burned to produce energy, say they would also emit much lower amounts of other pollutants that contribute to acid rain, smog and respiratory illness.

But for every small advance of the new technology, there are bigger setbacks. Many within the industry argue that it would be a waste of time and money to build such plants in the United States unless China, which passed the United States several years ago as the largest coal-consuming nation, also moves to limit carbon dioxide emissions from its rapidly growing array of coal-fired plants.

Will Government Act?

With widespread uncertainty in the state-regulated power industry, the debate has moved to the federal level, where testimony by senior energy executives before the Senate Energy Committee in April revealed a sharp fault line within the industry.

On one side, A.E.P., lined up with Peabody and other heavy coal users against mandatory limits on global warming gases if industrializing countries like China and India are not included. Others that have less to lose from carbon caps — like [Exelon](#) and [Duke Energy](#), which rely much more on nuclear power — spoke in favor of national limits that would include coal consumers.

The Bush administration has rejected mandatory limits on carbon dioxide emissions. Michele St. Martin, a spokeswoman for the White House Council on Environmental Quality, said, "such regulations would lead to higher energy prices, slower economic growth and fewer jobs for the U.S. as industries move overseas where greenhouse gas emissions are not similarly controlled."

But there is some support in Washington for such legislation. The two senators from New Mexico, Jeff Bingaman, a Democrat, and [Pete V. Domenici](#), a Republican, are working on a bill that could require limits on carbon dioxide emissions.

Ahead of the 2008 presidential election, two senators often mentioned as candidates, [Hillary Rodham Clinton](#), Democrat of New York, and [John McCain](#), Republican of Arizona, have endorsed mandatory cuts in emissions. Mr. Morris of A.E.P. said such support has persuaded him that limits might be imposed in coming years.

While Peabody supports some coal gasification projects, it remains skeptical about departing from traditional coal-burning methods to produce electricity.

The pulverized coal plants it wants to build, which grind coal into a dust before burning it to make electricity, currently cost about \$2 billion each, or 15 percent to 20 percent less to build than the cleaner "integrated gasification combined cycle," or I.G.C.C., plants, which convert coal into a gas.

The hope among scientists is that I.G.C.C. plants could be relatively quickly fitted with systems to sequester deep underground the carbon dioxide created from making electricity. Without such controls, the new coal plants under development worldwide could pump as much carbon dioxide into the atmosphere over their lifetimes as all the coal burned in the last 250 years, according to Jeff Goodell, who has written on coal for several publications, including [The New York Times](#), and is author of a new book on the coal industry.

But state and federal regulators have been hesitant to endorse the technology. Peabody and other companies remain skeptical that carbon-capture methods, whether for pulverized coal or combined cycle plants, will become commercially or technologically feasible until the next decade.

Legal battles over this reluctance have begun, with the Natural Resources Defense Council and the American Lung Association this year challenging the [Environmental Protection Agency](#) for allowing electric companies to move ahead with projects without evaluating the new technology.

In one key decision on the state level, the [Wisconsin Public Service](#) Commission rejected a proposal from WE Energies of Milwaukee in 2003 to build a plant with the new technology, saying it was too expensive and would result in higher electricity prices.

Capturing the Gas

Engineers have known how to make gas from coal for more than a century, using this method in the gaslights that first illuminated many American cities. A handful of coal gasification plants are already in operation in the United States, Spain and the Netherlands, built with generous government assistance.

Selling the captured carbon dioxide from coal gasification plants could make them more competitive with pulverized coal plants. One gasification plant in North Dakota, though different from an electric plant, already sends its carbon dioxide to Saskatchewan, where it is injected in aging oilfields to force more crude from the ground. And the oil giant [BP](#) announced a similar project in March for a refinery it owns near Los Angeles, using petroleum coke as a fuel there instead of coal.

Scientists have developed numerous other plans to pump away carbon dioxide, like shipping it to offshore platforms to inject it below the ocean floor. These plans are not without risk, with some officials concerned that carbon dioxide sequestration could trigger earthquakes. Yet, time and again, the most limiting factor remains economics.

As they proceed with plans to build pulverized coal plants, Peabody and other companies often point to their support of the alternative technology through their participation in Futuregen, a \$1 billion project started three years ago by the Bush administration to build a showcase 275-megawatt power station that could sequester carbon dioxide and reduce other pollutants.

Futuregen's 10 members include some of the world's largest coal mining companies, among them Peabody and [BHP Billiton](#) of Australia, as well as large coal-burning utilities like A.E.P. and the Southern Company.

One Chinese company, the China Huaneng Group, is also a member of Futuregen, while India's government signed on in March. Washington is financing the bulk of the project, more than \$600 million, with about \$250 million coming from coal and electricity companies and the rest from foreign governments.

But Futuregen is already behind schedule, with planners now hoping to choose a site for the plant by the end of the year, with an eye on starting operation by 2012. Environmental groups have criticized the project as too little, too late.

"Futuregen is a smokescreen, since it's not intended to bring technology to the market at the pace required to deal with the problem," said Daniel Lashoff, science director at the climate center at the Natural Resources Defense Council. "We don't have that kind of time."

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Advanced coal technologies promise to revive a floundering U.S. industry, but they seriously underestimate the transformational experience curves for renewables and energy storage technology. I've dedicated my career towards building a sustainable energy future and inspiring the next generation of sustainability leaders. As a founding member of Fluence, a global energy storage technology and services company backed by Siemens and AES, I'm at the forefront of the transformation of how we power our world. My experience includes instrumental roles in Europe's first commercial battery storage array as well as one of the largest battery storage fleet transactions in the world. The simplest split up as done by cofounders at Apple was : 1. Inward Facing (Left Brained work) : Every thing that goes on under the hood in the company. Essentially everything logical, product engineering, company processes, ground rules, tran... Make a rough list of all the activities that you are focussing on currently (on a white board or a piece of paper) and split them as fairly as possible based on the strengths/skills of the two people. Revisit this list after a week/month and soon you'll have a optimal/comfortable distribution of roles/resposabilities. But most in the industry are not making that bet. Among them is Gregory H. Boyce, chief executive of Peabody Energy, the largest private-sector coal producer in the world thanks in part to its growing operations here in Wyoming and with aspirations to operate coal-fired plants of its own. Mr. Boyce's company alone controls reserves with more energy potential than the oil and gas reserves of Exxon Mobil. No more than a dozen of the 140 new coal-fired power plants planned in the United States expect to use the new approach. The decisions being made right now in industry and government on how quickly to adopt any new but more costly technologies will be monumental. B The coal industry has been targeted by its critics as a significant contributor to the greenhouse effect. However, the greenhouse effect is a natural phenomenon involving the increase in global surface temperature due to the presence of greenhouse gases - water vapour, carbon dioxide, tropospheric ozone, methane and nitrous oxide - in the atmosphere. C The world-wide coal industry allocates extensive resources to researching and developing new technologies and ways of capturing greenhouse gases. Efficiencies are likely to be improved dramatically, and hence CO2 emissions reduced, through combustion and gasification techniques which are now at pilot and demonstration stages. Clean coal is another avenue for improving fuel conversion efficiency.