

New York Times: May 30, 2008 The Energy Challenge

## **Mounting Costs Slow the Push for Clean Coal** By [MATTHEW L. WALD](#)

WASHINGTON — For years, scientists have had a straightforward idea for taming [global warming](#). They want to take the carbon dioxide that spews from coal-burning power plants and pump it back into the ground.

President Bush is for it, and indeed has spent years talking up the virtues of “clean coal.” All three candidates to succeed him favor the approach. So do many other members of Congress. Coal companies are for it. Many environmentalists favor it. Utility executives are practically begging for the technology.

But it has become clear in recent months that the nation’s effort to develop the technique is lagging badly.

In January, the government canceled its support for what was supposed to be a showcase project, a plant at a carefully chosen site in Illinois where there was coal, access to the power grid, and soil underfoot that backers said could hold the carbon dioxide for eons.

Perhaps worse, in the last few months, utility projects in Florida, West Virginia, Ohio, Minnesota and Washington State that would have made it easier to capture carbon dioxide have all been canceled or thrown into regulatory limbo.

Coal is abundant and cheap, assuring that it will continue to be used. But the failure to start building, testing, tweaking and perfecting carbon capture and storage means that developing the technology may come too late to make coal compatible with limiting global warming.

“It’s a total mess,” said Daniel M. Kammen, director of the Renewable and Appropriate Energy Laboratory at the University of California, Berkeley.

“Coal’s had a tough year,” said John Lavelle, head of a business at [General Electric](#) that makes equipment for processing coal into a form from which carbon can be captured. Many of these projects were derailed by the short-term pressure of rising construction costs. But scientists say the result, unless the situation can be turned around, will be a long-term disaster.

Plans to combat global warming generally assume that continued use of coal for power plants is unavoidable for at least several decades. Therefore, starting as early as 2020, forecasters assume that carbon dioxide emitted by new power plants will have to be captured and stored underground, to cut down on the amount of global-warming gases in the atmosphere.

Yet, simple as the idea may sound, considerable research is still needed to be certain the technique would be safe, effective and affordable.

Scientists need to figure out which kinds of rock and soil formations are best at holding carbon dioxide. They need to be sure the gas will not bubble back to the surface. They need to find

optimal designs for new power plants so as to cut costs. And some complex legal questions need to be resolved, such as who would be liable if such a project polluted the groundwater or caused other damage far from the power plant.

Major corporations sense the possibility of a profitable new business, and G.E. signed a partnership on Wednesday with [Schlumberger](#), the oil field services company, to advance the technology of carbon capture and sequestration.

But only a handful of small projects survive, and the recent cancellations mean that most of this work has come to a halt, raising doubts that the technique can be ready any time in the next few decades. And without it, “we’re not going to have much of a chance for stabilizing the climate,” said John Thompson, who oversees work on the issue for the Clean Air Task Force, an environmental group.

The fear is that utilities, lacking proven chemical techniques for capturing carbon dioxide and proven methods for storing it underground by the billions of tons per year, will build the next generation of coal plants using existing technology. That would ensure that vast amounts of global warming gases would be pumped into the atmosphere for decades.

The highest-profile failure involved a project known as FutureGen, which President Bush himself announced in 2003: a utility consortium, with subsidies from the government, was going to build a plant in Mattoon, Ill., testing the most advanced techniques for converting coal to a gas, capturing pollutants, and burning the gas for power.

The carbon dioxide would have been compressed and pumped underground into deep soil layers. Monitoring devices would have tested whether any was escaping to the atmosphere.

About \$50 million has been spent on FutureGen, about \$40 million in federal money and \$10 million in private money, to draw up preliminary designs, find a site that had coal, electric transmission and suitable geology, and complete an Environmental Impact Statement, among other steps.

But in January, the government pulled out after projected costs nearly doubled, to \$1.8 billion. The government feared the costs would go even higher. A bipartisan effort is afoot on Capitol Hill to save FutureGen, but the project is on life support.

The government had to change its approach, said Clarence Albright Jr., the undersecretary of the Energy Department, to “limit taxpayer exposure to the escalating cost.”

Trying to recover, the Energy Department is trying to cut a deal with a utility that is already planning a new power plant. The government would offer subsidies to add a segment to the plant dedicated to capturing and injecting carbon dioxide, as long as the utility bore much of the risk of cost overruns.

It is unclear whether any utility will agree to such a deal. The power companies, in fact, have been busy pulling back from coal-burning power plants of all types, amid rising costs and

political pressure. Utility executives say they do not know of a plant that would qualify for an Energy Department grant as the project is now structured.

Most worrisome to experts on global warming, the utilities have recently been canceling their commitments to a type of plant long seen as a helpful intermediate step toward cleaner coal.

In plants of this type, coal would be gasified and pollutants like mercury, sulfur and soot removed before burning. The plants would be highly efficient, and would therefore emit less carbon dioxide for a given volume of electricity produced, but they would not inject the carbon dioxide into the ground.

But the situation is not hopeless. One new gasification proposal survives in the United States, by [Duke Energy](#) for a plant in Edwardsport, Ind.

In Wisconsin, engineers are testing a method that may allow them to bolt machinery for capturing carbon dioxide onto the back of old-style power plants; Sweden, Australia and Denmark are planning similar tests. And German engineers are exploring another approach, one that involves burning coal in pure oxygen, which would produce a clean stream of exhaust gases that could be injected into the ground.

But no project is very far along, and it remains an open question whether techniques for capturing and storing carbon dioxide will be available by the time they are critically needed.

The Electric Power Research Institute, a utility consortium, estimated that it would take as long as 15 years to go from starting a pilot plant to proving the technology will work. The institute has set a goal of having large-scale tests completed by 2020.

“A year ago, that was an aggressive target,” said Steven R. Specker, the president of the institute. “A year has gone by, and now it’s a very aggressive target.”



