



Springfield, IL  
January 2007

## **Coal Is King Again In Illinois Clean coal technology gives industry a charge**

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To say that the history of Illinois' coal industry has been fickle would be an understatement. The industry that began operation in Illinois nearly 200 years ago has been a double edged sword, on one hand receiving praise for providing well-paying jobs for workers and producing affordable electricity; yet on the other hand taking fire for pollution and safety issues.

The once thriving Illinois industry that employed 41,000 miners at its peak in the mid-1920s has seen the number of miners drop to 3,700 in recent years. It's seen coal production drop from 65 million tons in 1970, to 32 million tons in 2004. And it's seen emissions controls hammer high sulfur Illinois coal nearly to extinction, transforming once thriving mining communities into ghost towns.

But there may just be a silver lining to the dark cloud that has rained on the state's mining industry for the past 30 years. Global warming, which reportedly is caused at least in part by emissions from coal burning power plants, is forcing the need for clean coal technology. What could be a negative for the coal industry is actually a blessing in disguise. The newest clean coal technology doesn't burn coal, rather it gasifies it, and Illinois' high Btu coal is perfect for that application.

This photo depicts how much coal mining has changed over the years. In the late 1800s mules and miners alike were exposed to long hours of backbreaking work in terrible conditions.

Clean coal technology has sparked the resurgence of old coal mines and the development of several new mines throughout Illinois for fueling new coal plants that loom on the horizon. Most importantly, the state is waiting with anticipation to hear if an Illinois site has been selected for erecting the much-publicized FutureGen plant. This nearly zero-emissions coal gasification plant would greatly increase the demand for Illinois coal. The project site selection has been

narrowed to one of four locations. Two are in Texas, and the other two are Tuscola and Mattoon in Illinois.

Phil Gonet, President of the Illinois Coal Association, says, "We obviously think Illinois is the best site because no one has more bituminous coal east of the Mississippi than we do."

Illinois coal contains more energy than the oil reserves in Saudi Arabia. Coal is found underground in an area encompassing 37,000 square miles of Illinois, or 65 percent of the state's surface. Boasting 30 billion tons of recoverable coal reserves, Illinois has one quarter of the available bituminous coal and one-eighth of available coal in the country. It's estimated that the nation has a 250-year supply of coal. While bituminous coal requires extra "scrubbing," or cleaning, in coal burning plants to meet clean air requirements, it is ideal for coal gasification plants. The hotter the coal burns, the more effective it is in coal gasification.

The FutureGen power plant project, a collaboration between the U. S. Department of Energy and the FutureGen Alliance, will be the world's most advanced, nearly zero- emissions, coal-fueled power plant. The FutureGen Alliance is made up of a consortium of the world's largest coal producers and generators, spanning six continents.

The FutureGen plant will gasify coal, meaning that instead of being burned, the coal will be crushed, heated and pressurized with steam and oxygen. This process will create synthesis gas, or syngas, made of hydrogen and carbon monoxide. The synthesis gas will react with steam to produce additional hydrogen and a concentrated stream of carbon dioxide (CO<sub>2</sub>).

According to Gonet, "FutureGen differs from other operational and planned gasification projects because it will produce hydrogen as an energy source." The hydrogen produced will be used for electricity generation in turbines or fuel cells, or hybrid combinations of both technologies. The gasification process also allows for the separation of gases, which means it can produce natural gas very inexpensively. And once liquefied, the gas can be used as diesel fuel.

CO<sub>2</sub>, a by-product of processing coal and other fossil fuels, has long been regarded as the leading contributor to global warming. Through a technological breakthrough, captured CO<sub>2</sub> from the FutureGen plant will be injected deep in saline pockets found in sandstone and other geological formations more than 5,000 feet underground through a process called sequestration. Sequestering CO<sub>2</sub> prevents it from escaping from power plant stacks and safely stores it where it can't affect the environment.

This schematic shows how the FutureGen plant will operate, and the depth that carbon dioxide will need to be injected into sandstone formations far below the earth's surface for sequestration.

Image courtesy of the Illinois Department of Commerce and Economic Opportunity Office of Coal Development.

Illinois is also looking into using the CO<sub>2</sub> from the gasification plants to recover residual oil and natural gas from Illinois' oil and coal bed methane reserves. Illinois Governor Rod Blagojevich announced on December 6 that as part of his Energy Independence Plan released earlier this year the state is pursuing the construction of a CO<sub>2</sub> pipeline that will run from the 10 coal gasification plants slated for central and southern Illinois to the Illinois Basin oilfields in southeastern Illinois.

This win-win application for CO<sub>2</sub> could nearly double the amount of petroleum produced by Illinois annually without increasing harmful air emissions. Royalties from the recovered oil and gas would subsidize infrastructure costs related to transporting and permanently storing the CO<sub>2</sub> underground.

Gonet says, "As gasification becomes a commercially proven and successful technology, these gasification plants will replace coal burning plants over the next 20-25 years. And one of the reasons power companies will go towards that is because environmentalists like the technology."

And Illinois leaders like the technology too. In a news release distributed on July 25, Governor Rod Blagojevich said, "We have the coal, the geology and the strong support of the federal, state and local level for bringing the world's cleanest coal plant to Illinois. We are showing that Illinois coal can meet our future energy demands using cutting-edge technology that protects our environment and puts more people to work. For coal to be king again it has to be clean, which is why we are also offering the financial tools necessary to get this enormous public-private project off the ground here in Illinois."

In addition to \$250 million the FutureGen Alliance has fronted and \$730 million the federal government has contributed, the State of Illinois has offered \$80 million in state and local incentives to bring the plant here. The incentives include a direct grant of \$17 million, up to \$50 million in reduced-interest loans, sales tax exemptions and property tax abatement worth tens of millions of dollars, along with public improvement funding, and reimbursement for employee training costs.

While our state and local officials know how desperately the coal industry needs to bring this technology to the state and the potential economic impact it would bring, so do Texas leaders. Will President Bush's home state reap the political benefit? "I think we can discount any politics coming in here. I think that scientists are going to make this judgment and hopefully we'll win on the science part of it," says Gonet. He adds, "I haven't seen anything yet that would lead me to believe that it wouldn't. We're optimistic about that."

That's good because the estimated 1,300 construction jobs, 3,250 indirect jobs during construction, 150 permanent jobs, plus as many as 375 permanent spin-off jobs would be a tremendous boost to east-central Illinois. There, industrial unemployment has sharply risen in recent years, especially in hard hit Decatur. And the spin-off effect of the project in coal mining and trucking alone would affect many areas in the state.

Another area that could benefit from coal gasification is farming. Natural gas is required for producing fertilizer, and its rising cost has forced most fertilizer companies in this country to shut down.

"I was told that natural gas makes up 80 percent of the cost of fertilizer. When natural gas prices are so high, fertilizer companies have to compete against foreign sources where natural gas is cheaper," says Gonet. He adds that providing low cost products such as fertilizer in our own country will boost agriculture. That, and the multitude of grain ethanol plants that have begun to dot the Illinois landscape, are helping the long-struggling farmer as well.

Both Mattoon and Tuscola, which are rich in agriculture, have been tenacious in their quest to bring the plant to east central Illinois as well.

The artist's rendition illustrates the revolutionary FutureGen near zero-emissions gasification plant that could land in east central Illinois in the near future.

Images courtesy of the Illinois Department of Commerce and Economic Opportunity Office of Coal Development.

Brian Moody, Executive Director at the Tuscola Economic Development, Inc., says, "What's unique about Illinois is that we've been able to push the whole team concept. Texas is at a real disadvantage because their two locations are so far apart. Tuscola and Mattoon are in each other's back yards. So much of our work has been done together and that's been more cost-effective on our end."

Moody says it also comes down to the local community wanting to bring economic development into the area. "The greatest thing about this project is that the cooperation in the county is unbelievable. People have stepped up to the plate, and it's going to pay big dividends down the road. We were told early on that community support was going to be a big part of this." And Moody says the four local community colleges, Parkland in Champaign, Lakeland in Mattoon, Richland in Decatur and Lincoln Land in Springfield; stand ready to offer whatever job training skills would be necessary to prepare local workers for the newly created jobs.

But what if the FutureGen project doesn't come to Illinois? Regardless of whether the project comes to Illinois, or not, the state has conducted extensive research to prove to the world that we're ready for this type of clean coal technology to

come to Illinois. We have the resources, the community support, the financial support and a willing workforce that is ready whenever the technology arrives.

Duane Noland, FutureGen Task Force member, former legislator and President/CEO of the Association of Illinois Electric Cooperatives in Springfield, says, "Here we are in Illinois with this huge phenomenal resource of coal, so we need clean coal technology, and FutureGen can help to lead the way and that technology can become affordable for everyone. That's the key."

Gonet agrees, saying, "I think that once we start building one of these plants in Illinois it's going to snowball. As long as the prices for natural gas and oil remain high, it is going to happen in Illinois. I believe that oil prices will stay above \$50 a barrel and I believe that natural gas prices will exceed \$6 per million Btu, which will make the production of those products by gasifying coal economical and profitable. And again, no one has more coal than we do. We have high sulfur, high Btu coal, which is perfect for the gasification process. We're pretty excited about the future."

With two prospective sites for the FutureGen project, Illinois stands proudly behind its richest and most abundant resource. Even when coal was in a downslide, the people of Illinois weren't ready to give up on it. Frank Lloyd Wright once said, "The thing always happens that you really believe in; and the belief in a thing makes it happen." And so coal, which in its turbulent life has seen the best and worst of times, is back again as king of Illinois' energy generation industry.