SECURE ENERGY HOPES THAT ITS FIRST COAL-TO-SYNTHETIC NATURAL GAS PLANT IN ILLINOIS WILL BECOME A MODEL FOR THE NATION.

When Secure, a startup coal-conversion technology company based in St. Louis, was searching for a place to build its first plant that can convert coal into synthetic natural gas in 2006, it found the ideal spot in the town of Decatur, Ill. The company wanted a site with some infrastructure already in place to make construction quicker and cheaper, so it bought 30 acres of Caterpillar’s land at the equipment manufacturer’s plant in Decatur, including a coal-powered boiler that had never been used. “Decatur has a lot of good infrastructure,” says Lars Scott, co-founder of Secure Energy. “The boiler, the electricity, the water lines and the sewer lines are all in place.”

The gasifiers for the new plant arrived in March. “What’s really exciting is that these are the first gasifiers of this kind to be delivered in North America,” says Jack Kenny, the other co-founder of the company. He explains that while the technology is not new, it has been scaled up considerably by the manufacturer, Siemens. The gasifiers will convert coal into the carbon monoxide and hydrogen used to make the synthetic natural gas by exposing the coal to a controlled amount of oxygen and steam at a high temperature. “The gasifiers weigh 220 tons. Between them, they will handle up to 200 tons of Illinois coal per hour. The feeder vessels are 110 tons and look like they ought to be in ‘Star Wars.’”

Secure’s decision to set up shop in Decatur is also a big bonus for Illinois. The plant, which will likely cost $550 million and should be operational in 2011, will use 1.35 million tons of Illinois coal per year and produce enough clean, pipeline-quality synthetic natural gas to power 275,000 Illinois homes.

The sulfur-rich and abundant local coal was once a top source of energy around Decatur; but natural gas gained in popularity because it was cheaper and because of emissions concerns about burning coal. Now that U.S. reserves of natural gas are dwindling and the price is increasing, coal gasification technology can bolster domestic gas production, helping the country toward energy independence, while using the local coal in an environmentally sustainable way.

The Secure Energy plant will produce the synthetic natural gas through a process that reduces sulfur dioxide and carbon dioxide emissions to extremely low levels. When the plant is in production, it will produce about 900,000 tons of CO₂ per year, 45 percent less than would be emitted from a traditional coal-fueled plant.

In time, the company would also like to sequester the CO₂ produced at the facility. Secure Energy’s plan is to geologically sequester the CO₂ in the Mount Simon sandstone, the saline aquifer that sits below Decatur, about 7,000 feet beneath the surface. In fact, the U.S. Department of Energy is already funding a carbon-sequestration test project just a quarter mile from the plant.

The gasifiers can also be used to gasify other raw materials, not just coal. “The design of the technology is also very flexible on the fuel input, so we will start off using coal, but over time, we will have the opportunity to blend in different feedstocks, which could include other biomass feedstocks,” says Scott.

FINANCING THE PROJECT

After working with the Illinois Department of Commerce and Economic Opportunity, Secure Energy found that its Decatur project qualified for a $14.1 million grant under the Illinois Coal Revival Act. The company has not received any of those funds yet, but the State Treasurer’s Office has offered to make the company a $10 million bridge loan until the grant funding under the Illinois Coal Revival Act becomes available.

The company, which has already raised $56.4 million, has also applied to the U.S. Department of Energy for a $647 million loan guarantee under the 2005 Energy Act. “We’re one of eight applicants and one of two coal-to-natural-gas projects under consideration,” says Kenny. “We’re the furthest advanced, as we are a truly a shovel-ready project. We have all the necessary permits to begin construction.” Building will start as soon as the state or federal funding is in place.

It has also sold the future production of the plant already. Last September, BP agreed to purchase up to 67 million cubic feet of natural gas per day once the plant starts operating. BP will also buy any of the plant’s remaining output that is not sold to local customers. And in November, the Natural Gas Pipeline Company of America (NGPL) agreed to allow Secure Energy to ship natural gas from the Decatur plant on the NGPL pipeline starting in August 2011, which will enable it to supply gas all over Illinois.

When up and running, the plant will employ about 60 full-time employees and also create construction, mining and trucking jobs in the Decatur area; but it is not just Illinois that will likely benefit from the project. Scott says he hopes that the plant will serve as Secure Energy’s reference plant that will one day be reproduced at similar sites all over the country.