

Cleaner coal equipment arrives at Duke Energy plant

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Marking a giant step forward in the use of advanced coal technology, the first major pieces of equipment have arrived at Duke Energy's new power plant in Edwardsport, Ind. The facility will use what's known as "integrated gasification combined cycle (IGCC) technology." That mouthful of a term essentially means producing electricity with lower emissions than conventional coal plants. When it enters service in 2011, Duke's plant is expected to be the largest of its type in the world and will generate approximately 630 megawatts — enough to power about 400,000 homes.



Our ship's come in: Working from GE Energy's specifications, Belleli Energy of Italy manufactured a radiant syngas cooler (RSC). The shells of the RSC are seen here arriving at the port. As Jack Stulz, who will manage the Edwardsport plant, told the local newspaper: "The coal gasification process creates massive amounts of heat. These coolers use that heat to manufacture steam, which is then used to generate additional electricity." Construction of the RSC will take place on-site using mostly local labor, and is expected to be completed by the end of 2010.

In an IGCC plant, coal is heated to high temperature to create a synthesis gas or syngas, which is then processed to remove many emissions, such as nitrogen oxide, sulfur dioxide, mercury and particulate matter, before the gas is burned in a specially designed gas turbine to generate electricity. A component called a radiant syngas cooler sits under the gasifier and cools the syngas, creating steam, which powers a steam turbine, increasing plant efficiency.



Don't talk dirty: Half of all U.S. electricity comes from coal, and the demand for electricity globally is expected to double by 2030. It's why IGCC plants, such as this one powered by GE technology in Tampa, Florida, are seen not only as a way of meeting new energy needs, but as an efficient way to replace older plants.

While the Duke facility won't capture carbon — GE's IGCC plants are designed so that they can be easily retrofitted for the process, which involves taking CO₂ from the gasification-produced fuel, compressing it to a fluid and then pumping and storing it deep underground. The ability to switch to carbon capture will be of key importance when regulatory frameworks for capture and storage are eventually hammered out.

Meanwhile, further progress in the arena of advanced coal technology was made on Tuesday with an agreement GE signed with the University of Wyoming to build a \$100 million research center to improve technology to turn coal into clean-burning gas. Construction on the facility will begin next year.

GE Energy's Monte Atwell, general manager of IGCC technology, told the Associated Press that one of the primary goals of the Cheyenne plant is to refine and improve current technology to gasify coal from Wyoming's Powder River Basin, which is wetter than other types of coal that have been used in previous gasification processes. "If I can find a way to use PRB in a dry form, then that is a big efficiency gain and it's a tremendous potential for PRB in a gasification context," Atwell said.

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