

## Product of Ecomagination



### **IGCC: A Path Forward for Coal:**

Coal is an abundant and relatively low-cost natural resource used around the world to generate electricity. Continuing GE Energy's long tradition of innovation in energy-producing technology and our commitment to developing cleaner ways to generate electricity, we offer the integrated gasification combined cycle (IGCC) power plant.

GE's IGCC system converts coal into a cleaner burning fuel. This fuel is then burned in a gas turbine combined cycle system to generate electricity. IGCC plants provide a cleaner, economical coal-to-power option.

From our gasifier technology to our IGCC-capable turbines, GE's process and power experts develop the most economical and reliable approaches to IGCC technology. GE offers extensive experience and high availability solutions.

### **Leadership, experience and innovation**

GE has been in the forefront of IGCC technology from its inception. The first large-scale IGCC plant-Coolwater in Barstow, California, in 1984-used GE's gasification technology and a GE 7E gas turbine.

In 1996, the Tampa Electric Power Station's Polk I, 250 MW IGCC plant went online using GE's gasification and turbine technology. Since then, it has been powering homes in the Tampa, Florida, area with electricity produced at one of the cleanest coal plants in the world.

GE's IGCC gas turbine advancements include:

- Demonstration of fuel flexibility at Coolwater Power and process block heat integration at Tampa Electric
- Tri-fuel/dual gas combustion system for a customer in southeast Asia
  - Combustion of 95% hydrogen
  - The commercial introduction of the advanced IGCC 7FB in 2004, and the high

### **For More Information**

For more information regarding GE's IGCC solutions, contact:

#### **Americas**

- Mike Thuillez
- +1-713-803-0468
- [mike.thuillez@ge.com](mailto:mike.thuillez@ge.com)

#### **China/Asia**

- Luciano Mercado
- +1-713-803-0523
- [luciano.mercado@ge.com](mailto:luciano.mercado@ge.com)

#### **Europe & ROW**

- Patrick McKenna
- +1-713-803-0535
- [patrick.mckenna@ge.com](mailto:patrick.mckenna@ge.com)

hydrogen-capable 7FB-H2 in 2006

We continue to develop industry-leading IGCC technology for sites around the world. Today, GE's IGCC solutions incorporate the design and operating practices gained from decades of gasification license, syngas turbines and IGCC experience. We offer IGCC solutions with proven reliability, availability and maintainability.

**Lower emissions from "cleaner coal"**

At the front end of IGCC, is a process known as gasification. Gasification is a partial oxidation process that transforms coal into a synthesis gas (syngas). The syngas stream is then cleaned and sent to a unique syngas ready GE gas turbine/steam turbine combined cycle system where it is used to generate electricity. IGCC is unique because pollution-causing emissions are captured and cost effectively removed from the syngas stream before combustion.

"Cleaner coal" Emissions:

- Lowest permitted SO<sub>x</sub> emissions from a coal plant\*
- Lowest permitted NO<sub>x</sub> emissions from a coal plant\*
- Able to achieve strict mercury emissions requirements today
  - Carbon capture ready

\*Data based on the GE-designed 60Hz 630MW IGCC Reference Plant.

**Carbon capture ready**

With IGCC it is possible to capture any amount up to and including 90% of the CO<sub>2</sub> generated from coal. We've proven it. Thirty-three industrial coal gasification plants are using our technology and separating carbon as part of the manufacturing process. The GE-designed 630MW IGCC Reference Plant is designed to accommodate later retrofit with the GE Carbon Island™ that can deliver CO<sub>2</sub> equivalency to that of an F-class natural gas combined cycle plant.

Capturing carbon solves only half of the problem-that's why a total carbon solution for coal requires both Carbon Capture and Storage -- CCS for short.

**Alliance for Excellence**

To further strengthen our carbon capture capabilities, in May 2008, GE formed an Alliance with Schlumberger Carbon Services.

The agreement aligns GE's experience in IGCC systems with proven carbon capture capabilities and Schlumberger's geologic storage expertise and capabilities for site selection, characterization and qualification. This is a first-of-its-kind arrangement between leaders in IGCC technology and CO<sub>2</sub> storage to accelerate the commercial development and deployment of cleaner coal power.