



GE Energy

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News Release

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GE ENERGY UPDATES *H SYSTEM*[™]
FROM 480 TO 520 MEGAWATTS

Baglan Bay Serving as Validation Platform for Design Improvements

MILAN, ITALY – June 28, 2005 – Building on the successful performance of the world's first *H System*[™] at Baglan Bay in Wales, GE Energy has updated its 50-hertz, 109H technology from 480 to 520 megawatts, the company announced today at *Power-Gen Europe 2005*.

"Using the lessons learned during the testing and on-going commercial operation of the Baglan Bay unit, we were able to optimize the *H System* design," said Brian Ray, general manager of the *H System* product line for GE Energy. "The updated 9H system will further improve the economies of scale provided by large gas turbine combined-cycle power plants by enabling plants with fewer gas turbines to generate larger blocks of power."

For example, many of the large combined-cycle power plants built over the past few years have used GE 207FA combined-cycle systems (two F technology gas turbines, one steam turbine) to achieve output in the 520-megawatt range. Using the updated 9H technology, a combined-cycle system with only one gas turbine can produce an equivalent amount of power.

During test runs at Baglan Bay, the GE 109H system generated output of up to 530 megawatts at 44° F. The technology was introduced at a rating of 480 megawatts, or enough power for approximately half a million homes, operating on natural gas at ISO conditions. The *H*

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System is the first combined-cycle system in the world designed with the capability to achieve 60% thermal efficiency.

For several years, GE engineers have been analyzing data from the Baglan Bay unit, which was installed and began site testing in late 2002, entered commercial service in September of 2003 and recently completed 9,000 hours of commercial operation. This experience has been applied to the upgrade of the 9H design, which includes these key enhancements:

-- **Introduction of fuel moisturization.** Technology patented by GE will be used to add moisture to the gas turbine fuel (natural gas) to increase the mass flow through the turbine. This produces more output from the same amount of fuel, while also lowering emissions.

-- **Clearance control optimization.** The *H System* features an active clearance control system based on technology used in GE's aircraft engine designs for many years. The system increases clearances during startup and other transients in order to avoid casing rubs in the aft stages of the compressor and the first two turbine stages. Based on test data and successful performance of the Baglan unit, GE has been able to configure the system to achieve more optimal clearances for the first two turbine stages.

-- **Cooling and sealing improvements.** Based on test and commercial operation results, GE engineers have been able to compare actual operating temperatures to design requirements and make adjustments as required for each component of the gas turbine. This has enabled the original cooling design to be fine-tuned for optimal performance and parts lives.

Firing temperature will remain 2600° F (1400° C) class, but will be further optimized to take advantage of lower than expected temperature drop across the first stage nozzles.

The updated, 520-megawatt *H System* is commercially available today, and could be shipped as early as late 2007. Many of the new design features will be integrated into the existing unit at Baglan Bay, during a scheduled hot gas path inspection in 2007.

The *H System* uses an innovative, closed-loop steam cooling system and advanced coating materials to achieve the higher firing temperatures required for its increased efficiency, which also translates into improved environmental performance. For every unit of electricity produced, the *H System* uses less fuel and produces fewer greenhouse gases and other emissions when compared to other large gas turbine combined-cycle systems.

While Baglan Bay is the first global application of the *H System*, the planned North American launch site for the technology is Calpine Corporation's Inland Empire Energy Center in southern California. This 775-megawatt project will be based on two 60-hertz, GE S107H combined-cycle systems.

All future shipments of the *H System* will be covered under a previously announced agreement between GE and Toshiba of Japan. As part of this agreement, GE has *H System* integration and performance responsibility, and will design and manufacture the H technology gas turbines and integrated controls for the power train. Toshiba will manufacture the GE-designed compressors, along with Toshiba-designed generators and steam turbines.

About GE Energy

GE Energy (www.gepower.com) is one of the world's leading suppliers of power generation and energy delivery technology, with 2004 revenue of \$17.3 billion. Based in Atlanta, Georgia, GE Energy provides equipment, service and management solutions across the power generation, oil and gas, transmission and distribution, distributed power and energy rental industries.

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