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Delphi SECA Solid Oxide Fuel Cell Successfully Powered by Gasified Coal Environmentally friendly technology could make U.S. more energy independent

Release Date: September 4, 2003

TROY, Mich. - Delphi Corporation (NYSE: DPH) has proven that its Solid State Energy Conversion Alliance (SECA) Generation-2 solid oxide fuel cell (SOFC) can use coal-derived fuel gas for power.

The feasibility study took place in June 2003 at the Power Systems Development Facility (PSDF) coal-gasification plant in Wilsonville, Alabama. To advance coal-based power systems, the PSDF was established by the US Department of Energy (DOE). Southern Company manages and operates the facility and provides co-funding in conjunction with DOE and other industrial partners.

This effort tested whether gas produced from coal can be effectively used in a fuel cell to generate electricity. It was conducted under Delphi's existing cooperative agreement with the DOE's Office of Fossil Energy/National Energy Technology Laboratory (NETL).

"We're excited that Delphi's SOFC generated electricity using fuel gas. Fuel purity was an issue, especially using fuel from coal. SOFC's can tolerate contaminants. But tolerance to the wider range of contaminants in coal-derived fuel gas requires additional study, and this test provides insight on these interactions. The gas cleanup system that was tested achieved the needed fuel purity," said Dr. Jean Botti, chief technologist, Delphi Dynamics and Propulsion Innovation Center. "This significant achievement demonstrated that a planar low-temperature SOFC power generation system can produce electricity from gasified coal. Coal is abundant in the U.S., and this event is a good first step in proving that it is a viable, environmentally friendly resource for powering fuel cells."

According to the Department of Energy's Office of Fossil Energy, the U.S. has 350 years worth of coal reserves.

Gasification at the PSDF is based on an advanced circulating fluidized bed reactor. For this fuel cell test, a fuel gas cleanup system was added that included both hot gas and cold gas modules and provided fuel to the stack free of sulfur, chlorine, and tar.

The SECA fuel cell is being considered for the economical co-production of hydrogen and electricity from coal with near zero emissions. It is a candidate component for DOE's Office of Fossil Energy "FutureGen" initiative that is a key part of President Bush's Hydrogen Fuel Program.

Delphi's SOFC fuel cell was heated to an operating temperature of 750°C and then fueled by coal-derived fuel gas. The fuel gas consisted of a mixture of hydrogen, carbon monoxide, methane, carbon dioxide, water and nitrogen. This experiment was repeated with a second SOFC stack. The two stacks together operated for a period of more than 75 hours. The test successfully demonstrated that an SOFC fuel cell can generate expected levels of power from coal-derived fuel gas. Additional fuel testing on coal-derived fuel gas is being planned.

Delphi has been developing fuel-cell technology for the past 10 years and is a leader among industry-wide efforts to bring fuel-cell technology to the marketplace. This development effort involves the 10-year, \$138 million, cooperative agreement with NETL. The objective of the agreement is to produce and test a SECA SOFC power-unit design that can be mass-produced at low cost with multiple fuel options. This coal-gas feasibility study was conducted under this development project.

Delphi's development activities have concentrated on the progress of SOFCs that generate auxiliary electric power for passenger, commercial and military applications. Units are being designed to provide auxiliary power for mobile applications and stationary distributed generation that generate from 1kilowatt to 25kilowatts of power for while simultaneously reducing fuel consumption, emissions and noise.

Delphi is on track to meet the DOE's SECA cost and performance criteria for SOFC technology, and leads the way for making them viable for the commercial market.

For more information about Delphi and its operating subsidiaries, visit Delphi's Media Room at www.delphi.com/media.

For more information on SECA, visit www.seca.doe.gov.

For more information on NETL, visit www.netl.doe.gov.

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