Fuel Cell Technology Update – August 1, 2000

To: Reporters, editors and investors following business, energy, automotive and technology news.
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TRANSPORTATION APPLICATIONS

GM Unveils HydroGen1. General Motors unveiled its prototype, the HydroGen1 fuel cell, its smallest, most powerful fuel cell yet. The HydroGen1 is two-thirds smaller than previous GM models, yet provides 80 kW of power, and has a thermal efficiency of 53 to 67 percent. In addition, the HydroGen1 can start a car in temperatures as low as –40º C. http://www.gm.com.

Fuel Cell Hybrid in India. The Center for Energy Research at SPIC Science Foundation, in Chennai, India, has developed and demonstrated a prototype fuel cell–battery hybrid electric vehicle (EV) for the first time in India. This EV employs both PEM fuel cell stacks and lead-acid batteries in a 6-seater van. http://www.indiaserver.com/thehindu/2000/07/13/stories/08130001.htm.


ZeTek Launches Fuel Cell Boat. ZeTek Power’s marine operating division, ZeMar, worked with TTIB and Etaing Gmbh to launch the Hydra, a fuel cell boat running on hydrogen. The Hydra, which seats as many as 22 passengers, was designed to operate in shallow waters and to pass under low bridges. The 5kW fuel cell provides power to an electric motor, which drives the propeller. http://www.zetekpower.com/press/bonn.html.

Navy Launches Plans for an Electric Armada. The Office of Naval Research is giving Florida State University $10.9 million over three years to research and develop a new generation of ships built with electric drive and integrated power systems. The Navy is considering liquid fuel-powered turbines to power an integrated, electric-drive system, and is looking to incorporate fuel cells in the future. Construction of the new class of ship, known as the 21st Century Land Attack Destroyer, or DD-21, will begin in 2005. http://www.enn.com/news/enn-stories/2000/07/07252000/navyboat_14978.asp?P=1.

Energy Ventures Completes Methanol Research, Announces Joint Agreement with Sammer. Energy Ventures, Inc. (EVI) announced the completion of preliminary stages in research, development and demonstration of its new direct methanol fuel cell (DMFC) technology. The results proved that DMFC technology is a promising stand-alone technology that can be incorporated into other fuel cell formats.
Phase two of the research includes the construction of 150 W and 2.5 kW prototype fuel cells. EVI and Sammer Power Systems announced a joint development agreement to build demonstration units of EVI’s direct methanol fuel cell (DMFC). Sammer will assist EVI in constructing single cell samples into a three-cell stack. The agreement also permits that EVI is granted the rights to Sammer’s patented fuel cell assembly design for the life of the patent. http://www.energyvi.com.

**Unique Mobility to Develop High Performance Magnet Motors.** Unique Mobility has been awarded a two-year, $750,000 contract from the U.S. Department of Energy (DOE) to continue development of a modular line of high-performance motors for hybrid electric and fuel cell electric vehicles under the Small Business Innovation Research Program.

**STATIONARY POWER**

**Enbridge and Global Form Fuel Cell Pact.** Enbridge Inc., owner of Canada’s biggest gas utility, has formed an alliance with Global Thermoelectric to build units for powering and heating homes. Enbridge will buy C$25 million (US$17 million) of preferred shares in Global to give the firm the financial clout it needs for commercial launch of its residential natural gas-fuelled unit within five years. Global is currently building Canada’s first solid oxide fuel cell production plant and expects to deliver units to Enbridge for field testing in 2001. http://www.planetark.org/dailynewsstory.cfm?newsid=7660.

**Ceramic Fuel Cells Builds 25 kW System.** Australian fuel cell company Ceramic Fuel Cells Limited (CFCL) has completed its first large-scale experiment in the development of its flat-plate Solid Oxide Fuel Cell (SOFC) technology. A complete 25 kW system was built, including a large fuel cell stack, balance-of-plant and control system. The experiment supplied important data on the operation of larger stacks and system-stack integration, which will be invaluable for the next phase: a major product development program.

**FuelCell Energy Selected for Project, Receives DOE Award of $40 Million Increase and Three-Year Extension.** FuelCell Energy has been selected by King County, Washington to negotiate a fuel cell project using municipal digester gas and Direct FuelCell power plant technology. Delivery of the 1 MW power plant is expected in 2001. FuelCell Energy has been awarded by the U.S. Department of Energy (DOE) a $40 million increase and three-year extension of the Company’s agreement under the DOE Office of Fossil Energy’s Carbonate Fuel Cell Cooperative Program. Funding under the program has helped enable FuelCell Energy to develop its 300 kW, 1.5 MW and 3 MW class fuel cell power plant products that are planned for delivery to commercial customers in the second half of 2001 and 2002. http://www.businesswire.com/cgi-bin/f_headline.cgi?bw.071300/201950282&ticker=FCEL http://www.businesswire.com/cgi-bin/f_headline.cgi?bw.071800/202002386&ticker=FCEL

**Johnson Matthey Signs Deal With Energy Partners and TXU Europe.** Johnson Matthey, TXU Europe and Energy Partners have signed a deal to construct a micro combined heat and power (CHP) fuel cell system for use in the home. The micro CHP units will produce 3 kW of electrical power as well as useable heat.

**FUELS/REFORMERS/STORAGE**

**SHEC Labs Completes Development on Prototype Hydrogen Separator Technology.** Solar Hydrogen Energy Corporation (SHEC) has developed a process to use the heat energy of the sun to extract hydrogen out of water. SHEC concentrates sunlight with reflectors to create the heat required to split water into...
hydrogen and oxygen and has successfully developed an effective hydrogen gas separation process to integrate with the splitting process.  http://www.businesswire.com/webbox/bw.071200/201942043.htm.

**NUVERA to Deliver Fuel Processing Systems.** NUVERA Fuel Cells has announced that it will soon ship a complete gasoline-powered fuel processing system designed for testing fuel cell transportation applications. The units will be delivered to automakers in the U.S., Europe and Japan. NUVERA says it has successfully addressed the issue of sulfur removal in the conversion of gasoline to fuel cell power and that its fuel processing system can work with a variety of fuels. http://www.businesswire.com/webbox/bw.071200/201942043.htm.

**FSEC Hydrogen Center Approved by Board of Regents.** The Florida Solar Energy Center’s (FSEC) Hydrogen Research and Applications Center (HRAC) has been added to the State University System’s inventory or authorized centers. This recognition officially acknowledges the research activities of the new Hydrogen Center within FSEC, a research institute of the University of Central Florida. The HRAC is focusing its efforts on research to produce, store and apply hydrogen for both space and Earth applications. http://www.fsec.ucf.edu.

**PORTABLE POWER**

**Food Powers Fuel Cell.** Stuart Wilkinson of the University of South Florida in Tampa has built a microbial fuel cell (MFC) that can be powered by food, and runs a small robot – a gastrobot – named Chew Chew. Within the fuel cell lives a population of bacteria, which speed the breakdown of its food-fuel, releasing electrons that charge a battery. The MFC prefers meat because of its high energy density.

**FUEL CELL COMPONENTS**

**Altair Technologies Begins Membrane Development.** Altair Technologies, a subsidiary of Altair International, has begun development of ceramic oxide fuel cell membranes and reactive catalyst support structures. In addition, Altair is currently developing nanomaterials with potential applications in fuel cells. http://www.altairint.com.

**CONFERENCES/CALL FOR PAPERS**


**4th International Symposium on New Materials for Electrochemical Systems.** The 4th International Symposium on New Materials for Electrochemical Systems will be held July 9-13, 2001, in Montreal, Québec, Canada. For more details, please go to http://wwwnewmaterials.polymtl.ca.

**MISCELLANEOUS**

**H2OR Company is Established in Israel.** The H2OR Company, Ltd. has been established as the only Israeli firm solely dedicated to hydrogen energy. H2OR has signed an exclusive technology implementing
agreement with DCH Technology for the territories of Israel, Turkey, Middle East, the Eastern Mediterranean and Africa. H2OR will distribute DCH products, including fuel cells and hydrogen-specific leak detection equipment.


**VII Predicts Rise in Vanadium for Use With Fuel Cells.** Vanadium International Inc. (VII) announced that demand for vanadium could increase as more companies begin to use rechargeable vanadium battery systems to store energy produced by fuel cells. The company’s vanadium battery system produces no emissions and can be recharged and discharged indefinitely. [http://www.vanadiuminternational.com](http://www.vanadiuminternational.com).

**EBARA Invests Additional US$19 Million in Ballard Generation Systems.** EBARA Corporation has increased its ownership position in Ballard Generation Systems (BGS) to 11.4 percent from 6 percent, for a total subscription price of US$19.1 million. EBARA is involved in the development of cogeneration systems combining Ballard fuel cell stationary power generators with EBARA’s absorption chillers, and also is aiming to build ultra low emission energy systems based on Ballard’s generators using methane gas from wastewater treatment facilities as the fuel.

**EAC Hires Consultant for Fuel Cell Development.** Electric Auto Corporation (EAC) announced that T. Nejat Veziroglu has joined as vice president of hydrogen and fuel cell development. Veziroglu will serve EAC management by developing plans for the introduction of EAC’s Apollo Power Plant, an on-site power system which utilizes an Apollo fuel cell, a lead-cobalt battery and solar cells. [http://www.electricauto.com](http://www.electricauto.com).

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*Fuel cells generate electricity without combustion by harnessing the energy created when hydrogen and oxygen are chemically combined. Fuel Cells 2000 is an independent, nonprofit activity dedicated to the commercialization of fuel cell technologies.*