

news from **FUEL CELLS 2000**

Fuel Cell Technology Update – November 7, 2000

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

Let us know if you would prefer to receive the full updates via email, or if you wish to be removed from our list. *For more information on stories, call (202) 785-4222.*

LEGISLATION

President Approves \$100 Million Fuel Cell Appropriation. The Department of Energy will have more than \$100 million for fuel cell related programs in the new fiscal year, \$10 million above the President's request. The money is contained in the Interior Appropriation bill signed by President Clinton and gives \$52.7 million for stationary fuel cells, \$10 million more than requested, and approved the full request of \$41.5 million for transportation fuel cell research and \$5.5 million for buildings. Fuel cell projects will receive \$8.85 million from the FY2001 Transportation Appropriation, which was signed into law by the President on October 23, 2000. Georgetown University's fuel cell bus program will receive \$4.85 million, \$2.0 million is for University of Alabama's (Birmingham) fuel cell buses, \$1.0 million will go to West Virginia University for its fuel cell technology institute's propulsion and Intelligent Transportation System testing, and \$1.0 million is for AC Transit's zero-emission fuel cell bus deployment demonstration project in California.

Representative Introduces Fuel Cell Tax Incentives. U.S. Representative Nancy Johnson (R-CT) introduced a bill that would provide a tax credit for stationary fuel cell systems of five kW or greater with a generation efficiency of 30 percent or higher. Under the bill, known as H.R. 5339, a \$500 kW tax credit would be available from January 1, 2001, to December 31, 2005.

<http://www.house.gov/nancyjohnson>

TRANSPORTATION APPLICATIONS

DaimlerChrysler Unveils NECAR 5, Jeep Commander 2, Initiates Fuel Cell Tests.

DaimlerChrysler presented the NECAR 5, the latest version of the New Electric Car, in Berlin. The NECAR 5 runs on methanol, unlike its predecessor, the NECAR 4, which ran on hydrogen. DaimlerChrysler also unveiled the Jeep Commander 2 fuel cell concept vehicle, running on hydrogen reformed on-board from methanol. The vehicle is actually a fuel cell/battery hybrid concept, with a nickel-metal-hydride battery to provide supplemental energy during acceleration, and for cold starts. The battery also captures energy from regenerative braking. The hybrid powertrain gives the Commander 2 near-zero tailpipe emissions, while achieving double the fuel efficiency of a conventional SUV. DaimlerChrysler plans to initiate a series of tests on a new fuel cell vehicle specifically built for the California Fuel Cell Partnership. <http://www.daimlerchrysler.com>.

California Fuel Cell Partnership Opens Headquarters. The California Fuel Cell Partnership officially opened the doors to its newly constructed fuel cell vehicle headquarters facility in West Sacramento, California. The ceremony featured the Partnership debut of seven automotive

An Activity of the Breakthrough Technologies Institute
1625 K Street, NW, #725, Washington, DC 20006
Phone: 202/785-4222 Fax: 202/785-4313
<http://www.fuelcells.org>

manufacturers' fuel cell electric vehicles - the first time in history that these cars have been brought together. Fuel cell-powered buses were also demonstrated. The dramatic 55,000 square-foot facility, which houses fuel cell cars and a hydrogen fueling station, also features a public gallery area with educational exhibits, fuel cell models, and an interactive kiosk. Over the next few years, more than 50 fuel cell-powered cars will be demonstrated on California roads in real-world conditions - the largest concentration of fuel cell vehicles in the world. Twenty fuel cell buses will also be demonstrated in regular transit operations. http://www.fuelcellpartnership.org/releases/2000-11_01_cafc_opens_hq.htm

Nissan Demos Fuel Cell-Powered Xterra. Nissan showcased the new fuel cell-powered electric Xterra SUV at the California Fuel Cell Partnership headquarters' opening. In May Nissan began test drives in Japan of a direct hydrogen fuel cell vehicle equipped with a methanol reformer. The Xterra utilizes this technology as well as a neodymium magnet synchronous traction motor combined with a lithium-ion battery.

Volkswagen Introduces First Fuel Cell Car. Volkswagen introduced its first fuel cell-powered car at the California Fuel Cell Partnership headquarters' opening. The zero emission vehicle (ZEV) is called Bora HyMotion, based on the Jetta. The HyMotion fuel cell engine runs on hydrogen and has a power output of 75 kW.

GM, Toyota, XCELLSIS Join California Fuel Cell Partnership. General Motors, Toyota and XCELLSIS have joined the California Fuel Cell Partnership. The Partnership includes eight auto companies that will demonstrate more than 60 fuel cell electric vehicles in California over the next three years. Seven of the twelve vehicles featured at the Partnership's grand opening were powered by XCELLSIS fuel cell engines.

http://www.fuelcellpartnership.org/releases/2000-10-1_media_update.htm

http://www.fuelcellpartnership.org/releases/2000-10-16_gm_toyota.htm

<http://www.xcellsis.com>

Celanese Set to Announce Auto Fuel Cell Deal. Celanese is set to announce a deal with an engine manufacturer to develop a new fuel cell for auto motors. Celanese will supply the membrane for the fuel cell while Plug Power will produce the mechanical component.

FCT Completes Underwater Fuel Cell Tests. Fuel Cell Technologies (FCT) has finished the first underwater test of an aluminum-hydrogen peroxide fuel cell that will power an unmanned submersible 1,500 km under the polar ice cap. The fuel cell ran underwater for 170 hours and delivered 35 kW hours of energy.

STATIONARY POWER

Federal Environmental Lab to be Powered by Fuel Cell. A fuel cell-gas turbine "hybrid" power system is slated to power one of the federal government's principal environmental laboratories beginning in 2002. The new power generator, to be built by Siemens Westinghouse Power Corporation, will be installed at EPA's Environmental Science Center at Fort Meade, Maryland.

http://www.fe.doe.gov/techline/tl_fuelcell_ftmeade.html

Ballard Signs Agreement with Matsushita Electric Works. Ballard Power Systems has entered into an agreement with Matsushita Electric Works of Japan to supply fuel cells for 250-watt portable compact power generators for the Japanese market. Matsushita Electric Works will use the fuel cells for on-going field-testing and demonstration of the generators.

<http://www.ballard.com/viewpressrelease.asp?sPrID=173>

State of Arkansas Selects Enable Fuel Cells for School Demonstrations. The Arkansas Department of Economic Development has purchased and taken delivery of a hand-held personal/portable fuel cell (PFC) from Enable Fuel Cells Corporation, a subsidiary of DCH Technology. The State will feature the PFC in its campaign to promote awareness and commercialization of alternative energies, which includes demonstrations at schools and universities.

Universities Receive Fuel Cell Stacks for Competition. The Department of Energy (DOE) has selected Honeywell to build two 80-kW PEM fuel cells for the FutureTruck 2001, a competition that challenges student teams to re-engineer SUVs to increase fuel efficiencies. DOE purchased the fuel cells with funding provided by the Department of Transportation's National Highway Traffic Safety Administration. Virginia Tech and Texas Tech are the only two teams that have elected to go down the fuel cell path. http://gnet.org/Coldfusion/News_Page2.cfm?NewsID=13092

Fuel Cell Hybrid Design Exhibits 60% Efficiency. Seimens Westinghouse recently developed the conceptual design of a new fuel cell-gas turbine hybrid system, one of the first steps leading to the construction of the Department of Energy's (DOE) power plant of the future, called Vision 21. DOE's National Energy Technology Laboratory (NETL) sponsored the project, which integrates pressurized solid-oxide fuel-module with two gas turbines. DOE expects to have a Vision 21 power plant up and running in 10 to 15 years at efficiencies of 70 percent. For more information, email Norman Holcombe at norman.holcombe@netl.doe.gov.

FuelCell Energy and Enron North America Form Alliance. FuelCell Energy has entered into an alliance with Enron North America to develop and market FuelCell Energy's Direct FuelCell® products, focusing on state renewable and energy conservation programs. The transaction will help reach developing markets for clean and renewable energy, which may be served through distributed generation products. www.fce.com.

UniSource Energy/ITN Energy Systems Wins Fuel Cell Development Contract. The Advanced Technology Program Office of the National Institute of Standards and Technology (NIST) has awarded ITN Energy Systems, in partnership with UniSource Energy Corp., an initial \$2 million contract for "Integrated Planar Solid Oxide Fuel Cell Stack Development." The three-year program includes additional investment for a total estimated project budget of \$4 million.

FUELS/REFORMERS/STORAGE

Praxair to Head DOE Ultra-Clean Fuel Team. Praxair will lead one of eight U.S. Department of Energy teams that will develop new ultra-clean transportation fuels and emission controls to meet tailpipe emission standards later this decade. The team plans to leverage breakthrough ceramic membrane research in the ongoing oxygen transport membrane (OTM) technology alliance of Praxair, BP, Sasol and Statoil, all team members.

U.S. Navy Testing Syntroleum for Application in Fuel Cells. Syntroleum Corporation has produced and shipped synthetic fuel made to JP-5 specifications, under a purchase order from the Naval Surface Warfare Center Crane Division, under sponsorship from the U.S. Navy Office of Naval Research (ONR). The Navy project is to explore alternative fuels for fuel cell applications and will be tested in a fuel cell system manufactured by IdaTech.

http://biz.yahoo.com/prnews/001009/ok_syntrol.html

Dynetek Industries Selected by Ford Motor Company. Dynetek Industries is entering a multi-year Purchase and Supply Agreement, under which Dynetek will supply compressed hydrogen tanks to Ford for Ford's fuel cell vehicle programs. In return, the relationship includes an equity incentive program that will earn Ford a minority interest in Dynetek. www.dynetek.com

Texaco, ECD Join on Hydrogen Storage Venture. Texaco Energy Systems, Inc. (TESI) and Energy Conversion Devices (ECD) have joined to develop and advance the commercialization of ECD's technology to store hydrogen in metal hydrides. ECD will provide its proprietary technology and TESI will provide additional technological support and funding to the venture, which will be known as Texaco Ovonic Hydrogen Systems.

GM and BP Team Up on Low-Sulfur Gasoline. General Motors is planning on using BP's low-sulfur gasoline in the mid-sized vans manufactured at its Baltimore Assembly Plant. The facility will place more than 400,000 gallons of gasoline in the tanks of new vehicles produced each year.

<http://www.individual.com/frames/story.shtml?story=p1005140.100>

PORTABLE POWER

Ballard and Millennium Cell Announce Collaboration. Ballard Power Systems and Millennium Cell have entered into a joint agreement designed to aid in the development of Millennium's proprietary hydrogen generation system and its integration into Ballard's portable power fuel cell products. Under the agreement, Ballard paid \$2.4 million in advance for the exclusive right to license Millennium's technology in its products for a predetermined period. <http://www.ballard.com>

FUEL CELL COMPONENTS

H Power and SGL Carbon to Develop Graphite Plates. H Power signed a Memorandum of Understanding (MOU) with SGL Carbon to jointly develop graphite plate components for use in H Power's PEM fuel cells. The new plates are expected to cut H Power's primary component costs by 90%. www.hpower.com

LYDALL Introduces New Product Line. Lydall is introducing a new product line, LyFlex GDL (gas diffusion layer), a flexible, microporous, carbon nonwoven that is a critical component in the production of a fuel cell stack. The LyFlex GDL provides significant cost advantages that will allow for mass commercialization of fuel cell technology. www.lydall.com

Graftech Receives Patent for Fuel Cell Technology. Graftech announced that it has been granted a U.S. patent covering its flexible graphite composite material, which is useful as an electrode for a PEM fuel cell. Graftech holds more than 20 issued patents and 90 patent applications relating to fuel cell technology.

An Activity of the Breakthrough Technologies Institute
1625 K Street, NW, #725, Washington, DC 20006
Phone: 202/785-4222 Fax: 202/785-4313
<http://www.fuelcells.org>

REPORTS/MARKET STUDIES

ABI Reports on Alternative Fuels For Fuel Cell Market. Allied Business Intelligence has published a new report "Fuel Cell Fuels Infrastructure" which explores the technical and market dynamics of alternative fuels that will play large roles in future fuel cell markets. The report examines hydrogen, natural gas, gasoline, ethanol, methanol, coal, diesel, synthetic fuels, peroxide, zinc and aluminum in stationary, automotive and portable fuel cell markets.

BBC Report Details Future of Fuel Cell Markets. Business Communications Company, Inc. (BCC) will release a report detailing the future of fuel cell markets over the next five years. "Fuel Cell: On the Verge" reports that the current market for fuel cells is about \$218 million and is expected to grow to \$2.4 billion by 2005. <http://www.bccresearch.com>

NAVC Examines Future of Fuel Cells. The Northeast Advanced Vehicle Consortium (NAVC) released a new study on the future of fuel cells in transportation applications. The report, titled "Future Wheels: Interviews with 42 Global Experts on the Future of Fuel Cells for Transportation, Fuel Cell Infrastructure and a Fuel Cell Primer," is available on NAVC's web site – www.navc.org.

MISCELLANEOUS

Fuel Cells Canada is Created. Fuel Cells Canada, a private sector initiated, not-for-profit, national organization, has been inaugurated to provide services and support to all stakeholders involved in the development of the fuel cell industry in Canada.

Dais-Analytic Announces Alliance with Enron North America, LG-Caltex Oil and KIPLEX. Dais-Analytic announced an alliance with Enron North America to support market development, distribution and other field services for Dais-Analytic's fuel cell, humidity control and related products. Dais-Analytic also created a joint venture with LG-Caltex Oil, part of the Korean LG Group, and KIPLEX, a technology transfer and venture development company based in Seoul. The venture, Clean Energy Technologies, will manufacture, market and service stationary power generators in the Asia Pacific region based on Dais-Analytic's fuel cell technology. <http://www.daisanalytic.com>

EVI and the Alberta Research Council Join for DMFC Venture. Energy Ventures Inc. (EVI) has signed a non-binding letter-of-intent with the Alberta Research Council (ARC) to enter into a joint venture relationship built around a development and commercialization program for EVI's Direct Methanol Fuel Cell (DMFC). Under the proposed venture, ARC will invest up to \$3.0 million over a three year period in exchange for common share equity and warrants in EVI. EVI will also move some fuel cell activities up to a new facility in Alberta. www.energyvi.com

Chevron/Texaco Merger Will Pursue ECD's Advanced Energy Technologies. Energy Conversion Devices (ECD) said that its partnership with Texaco has been expanded and strengthened with the announcement of Texaco's merger with Chevron Corporation to form ChevronTexaco Corporation. ChevronTexaco will aggressively pursue the commercialization of energy technologies, including the Ovonic Regenerative Fuel Cells technology that Texaco and ECD are developing. www.ovonic.com

Survey Reveals Not Many Californians Know About Fuel Cells. A survey commissioned by the California Fuel Cell Partnership showed that less than one in four Californians knew what a fuel cell was, but after hearing how one works, nearly eight in ten had a favorable attitude towards the

technology. The survey polled 600 adults. <http://www.drivingthefuture.org>.

Via-Tek and EAC Enter Into Discussions for Fuel Cell. Via-Tek has entered into discussions with Electric Auto Corporation (EAC) in regards to the use of EAC's alkaline fuel cell with Via-Tek's hydrogen gas generator. The hydrogen gas generator produces hydrogen gas from water via the time release of measured amounts of an alkaline metal emulsion into a water reservoir. This technology combined with EAC's alkaline fuel cell can establish hydrogen fuel as a viable fuel choice for fuel cell technology.

Fuel Cells 2000's Fall 2000 Fuel Cell Directory Now Available. The Fall 2000 edition of Fuel Cells 2000's *Fuel Cell Directory*, with complete listings of fuel cell manufacturers, researchers and consultants, suppliers to the fuel cell industry, utilities, associations and interested government agencies, is now available. The Fall 2000 directory has increased its listings since the 1999 edition to over 750 entries. There is also added information such as stock symbols, investor, media and human resource contacts, and the name of the President or CEO, as well as current research projects and fuel cell type. The directory is US\$100 dollars for a print copy and US\$500 dollars for a CD-ROM MS Excel database version. To order, please contact Marleen Alexander at marleen@fuelcells.org.

U.S. Fuel Cell Council Publishes Media Guide. The U.S. Fuel Cell Council (USFCC) has published its first Media Guide, a detailed listing of the organizations leading the fuel cell industry. The guide provides detailed listings for 50 fuel cell developers and manufacturers, key component suppliers, research institutions and governmental agencies. For more information, go to <http://www.usfcc.com>.

Geoffrey Ballard Awarded Environmental Prize. Geoffrey Ballard was awarded the City of Goteborg International Environmental Prize for his visionary work on zero-emission vehicles. The prize was established last year to "stimulate a continued positive development and bring attention to...strategically interesting environmental projects."

REQUESTS FOR PROPOSALS

DOE R & D Analysis for Fuel Cells. The U.S. Department of Energy (DOE) plans to issue a solicitation for financial assistance applications for research, development and analysis of automotive and stationary fuel cell power systems, fuels for fuel cells, and Compression Ignition Direct Injection (CIDI) engines. Approximately \$80 million in DOE funding is anticipated for the fuel cell awards. For more information, contact Robert Lowther at rlowther@doeal.gov.

Hydrogen Refueling Stations. AQMD is soliciting proposals to develop and demonstrate distributed hydrogen refueling stations within the South Coast Air Basin in an amount not to exceed \$700,000 from the Clean Fuels Fund. <http://www.aqmd.gov/rfp>

CONFERENCES/CALL FOR PAPERS

F-Cells: Fuelling the Stationary Power Revolution. "F-Cells: Fuelling the Stationary Power Revolution" will be January 31 – February 1, 2001 at the Hilton Hotel in San Diego, California. For more information, email stationaryfcells@iqpc.co.uk.

Hydrogen Power. “Hydrogen Power – Theoretical and Engineering Solutions” International Symposium will be held September 9-14, 2001 in Stralsund, Germany. For more information, go to <http://www.hypothesis.de>.

- ### -

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.

**An Activity of the Breakthrough Technologies Institute
1625 K Street, NW, #725, Washington, DC 20006
Phone: 202/785-4222 Fax: 202/785-4313
<http://www.fuelcells.org>**