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## **FUEL CELL CONNECTION - September 2005 Issue**

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~~~~~ News on U.S. Government Fuel Cell Programs ~~~~~

----- 1. *Coast Guard Demonstrates Successful Fuel Cell*

The Summer 2005 issue of *FEMP Focus* features an article detailing the success of a fuel cell demonstration at the U.S. Coast Guard Air Station Cape Cod. According to the article, the 250-kW DFC300 fuel cell, manufactured by FuelCell Energy, resulted in a total net savings of almost \$24,000 in operating expenses in just the first 12 months of its operation.

http://www.eere.energy.gov/femp/newsevents/fempfocus_article.cfm/news_id=9327

----- 2. *PNNL Researchers Examine Refillable Hydrogen Storage Material*

Researchers at the Pacific Northwest National Laboratory (PNNL) have characterized a material that might allow on-board refueling of hydrogen vehicles. Diammoniate of diborane (DADB) appears to hold promise for reversibility, and might spontaneously uptake hydrogen fuel.

<http://www.pnl.gov/news/notes/transportation05.stm>

----- 3. *Energy Groups form FutureGen Industrial Alliance for DOE Collaboration*

Nine coal producers and utilities have formed the FutureGen Industrial Alliance, a coalition specifically meant to partner with the Department of Energy on its FutureGen program. The goal of the FutureGen program is to design a power plant for producing both electricity and hydrogen from coal. <http://biz.yahoo.com/prnews/050913/cgtu032.html?.v=25>

----- 4. *Protonex and Northrop Grumman Team to Develop Fuel Cells for Air Force*

Protonex Technology Corporation and Northrop Grumman have signed a teaming agreement to develop a portable power fuel cell system for the U.S. Air Force. The companies recently demonstrated a prototype of the system for the Air Force Research Laboratory. The system is based on a 30-Watt portable fuel cell fueled by a chemical hydride.

<http://www.protonex.com/Northrop%20Grumman%20Release%20FINAL.pdf>

----- 5. *DOE EERE Office Launches Financial Opportunities Web Site*

The Department of Energy's Office of Energy Efficiency and Renewable Energy has launched a web site that lists opportunities for financial assistance, including current and past solicitations.

<http://www.eere.energy.gov/financing/>

~~~~~ RFP/Solicitation News ~~~~~

----- 6. *DOE Releases SBIR/STTR Solicitation*

DOE has released its FY 2006 Funding Opportunity Notice for its Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. Technical topics include Manufacturing for the Hydrogen Economy. DOE expects to award approximately 290

fixed obligation Phase I research grants, ranging up to \$100,000 each, through this solicitation. Deadline for applications is December 2, 2005.

<http://www.science.doe.gov/sbir/solicitations/FY%202006/contents06.htm>

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**Contract / Funding Awards**  
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7. DOE Awards \$4.7 Million to GATE Centers of Excellence

The Department of Energy has awarded \$4.7 million to eight universities that will be Graduate Automotive Technology Education (GATE) Centers of Excellence. The goal of GATE is to train a future workforce of automotive engineering professionals to overcome technology barriers to cost-effective, high-efficiency vehicles for the U.S. market. Areas of focus for some of the Centers will include automotive fuel cell systems, hydrogen fuel cell hybrid vehicles, and high power energy storage systems.

http://www.energy.gov/engine/content.do?PUBLIC_ID=18602&BT_CODE=PR_PRESSRELEASE_S&TT_CODE=PRESSRELEASE

8. DOE Awards Contract to SRI International for Hydrogen Generation System

The Department of Energy has awarded a four-year, \$2.2 million contract to SRI International for the development of a prototype of a modular industrial system that uses steam electrolysis for low-cost generation of hydrogen. The goal of the project is to generate ultra-pure hydrogen at a cost of \$2-3 per gallon gasoline equivalent.

<http://www.sri.com/news/releases/08-30-05.html>

9. Navy Contracts with UTC Fuel Cells on PEM Seal System

The Naval Air Warfare Center Weapons Division at China Lake has awarded a \$647,529 contract to UTC Fuel Cells for the technical validation of a PEM fuel cell advanced non-silicone interfacial seal system.

<http://www.fbo.gov/spg/DON/NAVAIR/dept2/Awards/N6893605C0060LnCLIN%2DSubCLINs%200001%20through%200002.html>

10. Air Force Awards Additional Funding to UQM Technologies for Electric Pickup Truck

The U.S. Air Force has awarded additional funding to UQM Technologies to purchase and evaluate a high voltage battery charging system and engineer an electric pickup truck for the future installation of a fuel cell auxiliary power unit.

<http://www.uqm.com/press/news/06-12.html>

11. Army Awards Contract to Ashlawn Group for Munitions Fuel Cells

The U.S. Army's Armament, Research and Engineering Center has awarded a contract to Ashlawn Group to produce and demonstrate the performance of 120 PEMERY™ P-100 fuel cells for use as post-launch power sources for the Army's Multi-Option Fuze Artillery.

<http://www.ashlawngroup.com/shownews.asp?newsid=43>

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**State Activities**  
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12. *Florida DEP to Test Ford Fuel Cell Vehicles*

Ford Motor Company delivered three Focus fuel cell vehicles to the Florida Department of Environmental Protection and two vehicles to Progress Energy as part of a five-city, 30-car program to conduct real-world testing of fuel cell vehicles.

http://media.ford.com/newsroom/release_display.cfm?release=21628

13. *Connecticut Unveils Innovative Hydrogen Transportation Project*

The Greater New Haven Transit District has awarded its Advanced Transportation System Development Program to an Integrated Product Development Team led by the Gas Technology Institute. The project, which seeks to develop a "solutions package" for hydrogen-powered transit operations, is part of the National Hydrogen Initiative administered by the Federal Transit Administration.

<http://www.fuelcelltoday.com/FuelCellToday/IndustryInformation/IndustryInformationExternal/NewsDisplayArticle/0,1602,6425,00.html>

14. *California PUC Launches \$2 Billion Energy Efficiency, Conservation Campaign*

The California Public Utilities Commission has authorized energy efficiency plans and \$2 billion in funding for 2006-2008 for the state's utilities. As part of the campaign, funding for the Governor's Green Building Initiative will increase to \$230 million per year.

http://www.cpuc.ca.gov/PUBLISHED/NEWS_RELEASE/49757.htm

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**Industry Headlines**  
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15. *Verizon Operating Nation's Largest Fuel Cell Pilot Project*

Verizon is now operating the nation's largest fuel cell pilot project, featuring seven 200-kW fuel cell systems built by UTC Power. The fuel cells are expected to save Verizon some \$250,000 annually in commercial power costs, as well as eliminate approximately 11.1 million pounds of carbon dioxide. The fuel cells provide power, heat and water to a building that houses the Verizon central switching office, which provides local, long-distance and data services over about 35,000 phone lines in the area.

<http://newscenter.verizon.com/proactive/newsroom/release.vtml?id=92841&PROAC>

16. *Toshiba Integrates Prototype DMFCs Into Mobile Audio Players*

Toshiba Corporation announced it has developed two prototype DMFC units and has begun tests to validate their operation with mobile audio players. The new units have an output power of 100 mW and 300 mW and have been integrated into a flash-memory-based digital audio player and an HDD-based digital audio player, respectively.

http://www.toshiba.co.jp/about/press/2005_09/pr1601.htm

17. *IdaTech Obtains European Conformity Certification*

IdaTech announced it has satisfied all requirements for European Conformity (CE) certification for its 5-kWe hydrogen based ElectraGen™5 fuel cell, which means the company can now sell and operate the systems in Europe.

<http://www.idatech.com>

18. *Portable Fuel Cell Rental Program Launched*

Sandpiper Technologies has announce the launch of its Fuel Cell Power Rent-to-Own Program, which will allow first-time users to try a 50-Watt methanol-fueled Remote Power System for at least two weeks with a 100% rental credit towards immediate purchase.

<http://www.sandpipertech.com>

19. Hydrogen Fuel Cell Field Trials at Wal-Mart Completed

Cellex Power Products announced the successful completion of its Alpha hydrogen fuel cell product field trials at the logistics subsidiary of Wal-Mart Stores, where four fuel cell power units operated for two weeks to provide power for a fleet of pallet trucks.

http://www.cellexpower.com/about_news.php#20

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**University Activities**  
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20. Georgia Tech Researchers Pinpoint Chemical to Improve PEMFC Efficiency

Researchers at the Georgia Institute of Technology have pinpointed a chemical, Triazole, that could allow PEM fuel cells to operate at a much higher temperature without moisture, which could lead to higher efficiency of PEMFCs.

<http://www.gatech.edu/news-room/release.php?id=618>

21. H2U Student Design Contest Accepting Team Registrations

The 2006 H2U Student Design Contest is challenging university students to design hydrogen storage systems to provide realistic benefits over alternative storage systems such as batteries. Team registrations are due October 10, 2005. Designs will be due November 21, 2005.

<http://www.hydrogencontest.org>

22. University Fuel Cell Roundup

(summaries contributed by Kathy Haq, Dir. of Outreach and Communications, National Fuel Cell Research Center, UC Irvine, khaq@nfcrc.uci.edu)

Johns Hopkins Professor Jonah Erlebacher believes platinum-coated gold membranes can deliver more power per platinum used than other fuel cell designs that employ platinum particle blends. The U.S. Department of Energy has awarded him a Hydrogen Fuel Initiative grant to continue his research in this area. Erlebacher's work has inspired teacher Jim Ringlein, who is planning to teach his Lancaster Country Day School physics students about this cutting-edge technology. Ringlein this summer took part in a two-week teaching internship involving Erlebacher. [28-Aug-05, *Sunday News (Lancaster, Pa.)*]

A team of researchers at the University of Alabama is carrying out a five-year, \$2.24 million study on how to develop storage materials for hydrogen, part of \$1.2 billion in research funding President Bush set aside in 2003 to examine alternative fuel sources. "We have to solve this problem now before it creates an even greater challenge for future generations and the environment," said Anthony Arduengo, a UA chemistry professor who is leading the hydrogen research along with fellow professor David Dixon and department chairman Joseph Thrasher. [28-Aug-05, *Birmingham News (Alabama)*]

Engineers at Purdue University in West Lafayette, Ind., have developed a new way of producing hydrogen for fuel cells to automatically recharge batteries in portable electronics, such as notebook computers, and eliminate the need to use a wall outlet. The researchers developed the new method earlier this year and envision a future system in which pellets of hydrogen-releasing

material would be contained in disposable credit-card-size cartridges. Once the pellets were used up, a new cartridge would be inserted into devices such as cell phones, personal digital assistants, notebook computers, digital cameras, handheld medical diagnostic devices and defibrillators. The method also might have military applications in portable electronics for soldiers and for equipment in spacecraft and submarines. The team's findings were presented during the annual meeting of the American Chemical Society in Washington, D.C. The paper was written by research scientist Evgeny Shafirovich, postdoctoral research associate Victor Diakov and Arvind Varma, the R. Games Slayter Distinguished Professor of Chemical Engineering and head of Purdue's School of Chemical Engineering. [29-Aug-05, *AScribe Newswire*]

A group of researchers from the University of Southern California, the California Institute of Technology, Northwestern University and Lawrence Berkeley National Laboratories have developed a propane-powered fuel cell that can last far longer than the average lithium ion battery. Scaled down to roughly the size of a watch battery, these fuel cells contain a much greater power density and are powered by propane. The researchers say use of hydrocarbons such as propane is ideal because they pack more energy and can be stored as liquids rather than pressurized gases. Although the development of these fuel cells has come a long way, they are still years away from hitting the market, according to a member of the research team, which has collaborated on the project since 2002. The project was funded in part by the Defense Advanced Research Projects Agency (DARPA), the central research and development organization for the U.S. Department of Defense. [30-Aug-05, *University Wire*]

Rolls-Royce Fuel Cell Systems has partnered with Cambridge University's Department of Chemical Engineering with a goal of developing laser sensors able to monitor the internal performance of industrial-scale fuel cells. The five-year, government-backed project will use advanced-fiber laser technology to enable wide-spectrum measurement of the complex physical and chemical conditions within fuel cells or combustion engines. [5-Sept-05, *The Engineer*]

Miami University recently recognized Professor James Cox with a Distinguished Scholar award for his research on how lightly platinum nano-particles can be distributed on a surface and still produce hydrogen gas. A professor in the chemistry and biochemistry departments, Cox will be given a \$2,000 stipend as part of the award. Cox collaborates with scientists from around the world to further advance his research. [6-Sept-05, *University Wire*]

Mathematics of Information Technology and Complex Systems (MITACS) places some of Canada's top mathematical sciences students into western Canadian businesses through an internship program that allows the students to apply their math skills to "real world" research problems, such as the modeling of fuel cells. MITACS is a national research network that focuses on developing mathematical solutions in five of the Canadian economy's fastest-growing sectors: biomedical and health; environment and natural resources; information processing; risk and finance; and communications, networks and security. The organization announced in July that it had received \$2.3 million in funding from government and industry sources to place more than 100 of Canada's top mathematical sciences students in businesses over the next two years. Its Web site is www.mitacs.ca. [7-Sept-05, *The Edmonton (Alberta) Journal*]

Students in the Engineering Clinic program at Harvey Mudd College in Claremont, Calif., will help design fuel cells for Direct Methanol Fuel Cell Corporation (DMFCC), a subsidiary of VIASPACE Inc. The corporation recently announced that it had become a sponsor of the program, in which a team of four students and a faculty advisor address technical problems for corporate clients. The corporate sponsor retains rights to all intellectual property developed by the team. DMFCC produces methanol fuel cartridges that provide the energy source for laptop computers and other portable electronic devices that will be powered by direct methanol fuel cells. The Harvey Mudd Clinic team will work on innovative approaches to fuel cartridges including safety and child resistance. [8-Sept-05, *PR Newswire US*]

Researchers at Ohio State University have been running cow manure-powered fuel cells that generate enough electricity to keep rechargeable AA batteries up and running. Various laboratories are studying the potential of certain microbes to run fuel cells using such raw material as sewage. The Ohio State team takes its inspiration from one of nature's most efficient microbial processing systems — the main stomach of a cow. Microbes in a cow's rumen fluid release electrons as they break down cellulose in the cow's feed. The team has used this fluid as the source of electrons for a fuel cell's electric current. This is the first time a microbial fuel cell has used cellulose as its energy source, according to an Ohio State announcement. [17-Sept-05, *Hamilton Spectator (Ontario, Canada)*]

Earlier this month, the New Jersey Board of Public Utilities' Office of Clean Energy opened the New Jersey Hydrogen Learning Center to local policymakers, business leaders and other stakeholders in the emerging hydrogen economy. The overall goal of the program is to create a network of these stakeholders, who will work in conjunction with its university partners: Rutgers University, Ramapo College, The Richard Stockton College of New Jersey, Ocean County Community College, and the College of New Jersey. Each college is responsible for creating an "educational module," which will use existing hydrogen fuel facilities to promote research and host meetings for stakeholders in order to create a policy consensus. [23-Sept-05, *University Wire*]

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**Administration**  
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Press releases and story ideas may be forwarded to Bernadette Geyer, editor, for consideration at bernie@usfcc.com.

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The Sponsors

US Fuel Cell Council -- The US Fuel Cell Council is the business association for anyone seeking to foster the commercialization of fuel cells in the United States. Our membership includes producers of all types of fuel cells, as well as major suppliers and customers. The Council is member driven, with eight active Working Groups focusing on: Codes & Standards; Transportation; Power Generation; Portable Power; Stack Materials and Components; Sustainability; Government Affairs; and Education & Marketing. The Council provides its members with an opportunity to develop policies and directions for the fuel cell industry, and also gives every member the chance to benefit from one-on-one interaction with colleagues and opinion leaders important to the industry. Members also have access to exclusive data, studies, reports and analyses prepared by the Council, and access to the "Members Only" section of its web site. (<http://www.usfcc.com/>)

National Fuel Cell Research Center -- The mission of the NFCRC is to promote and support the genesis of a fuel cell industry by providing technological leadership within a vigorous program of research, development and demonstration. By serving as a locus for academic talent of the highest caliber and a non-profit site for the objective evaluation and improvement of industrial products, NFCRC's goal is to become a focal point for advancing fuel cell technology. By supporting industrial research and development, creating partnerships with State and Federal agencies, including the U.S. Department of Energy (DOE) and California Energy Commission

(CEC), and overcoming key technical obstacles to fuel cell utilization, the NFCRC can become an invaluable technological incubator for the fuel cell industry. (<http://www.nfcrc.uci.edu/>)

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