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## **FUEL CELL CONNECTION - October 2006 Issue**

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**News on U.S. Government Fuel Cell Programs**  
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*1. SECA SOFC Prototype Exceeds DOE Target Performance Specifications*

A 6-kW prototype SOFC system developed by General Electric through the Solid-State Energy Conversion Alliance (SECA) Program has exceeded DOE's key performance specifications for both efficiency and potential for low cost. The prototype achieved 49% efficiency, well above the minimum program requirement of 35%. The system has the potential to achieve close to 50% efficiency using coal as fuel.

[http://www.ge.com/research/grc\\_7\\_1\\_15.html](http://www.ge.com/research/grc_7_1_15.html)

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*2. NASA to Field Test Eight Fuel Cells at Lab Facility*

The NASA Glenn Research Center in Cleveland, Ohio, will perform a field test of eight next-generation GenSys® fuel cell systems from Plug Power. The units will provide grid-connected power for portions of the lab facility. The project, which is expected to begin in November, is being funded by the Ohio Department of Development's Third Frontier Fuel Cell Program.

<http://www.plugpower.com>

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*3. USPS Expands Testing of GM Fuel Cell Vehicles*

The U.S. Postal Service is expanding its testing of General Motors' fuel cell vehicles by adding a HydroGen3 fuel cell minivan to its fleet in Irvine, California. The minivan will be the first fuel cell vehicle to be used in regular postal delivery service on the West Coast.

<http://media.medialink.com/WebNR.aspx?story=32448>

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*4. ORNL Research Enables Easier Hydrogen Flow*

Research at Oak Ridge National Laboratory (ORNL) could help distribute hydrogen more efficiently to service stations in the future. A team of ORNL researchers has found fiber-reinforced polymer material significantly reduces embrittlement created in metallic materials and can reduce the number of welds and joints needed for delivering fuel.

[http://www.ornl.gov/info/press\\_releases/get\\_story\\_tip.cfm?ID=68](http://www.ornl.gov/info/press_releases/get_story_tip.cfm?ID=68)

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*5. DOE Releases \$3 Billion Climate Change Technology Program Strategic Plan*

The Department of Energy has released its Climate Change Technology Program Strategic Plan, detailing approximately \$3 billion in federal spending for climate technology research, development, demonstration and deployment. The plan examines hydrogen, energy efficiency, and renewable energy among a variety of technologies to reduce greenhouse gas emissions.

<http://www.climatechange.gov/stratplan/final/index.htm>

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**RFP/Solicitation News**  
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*6. NSF HBCU-UP Grants Available*

The National Science Foundation is accepting applications for grants through its Historically Black Colleges and Universities Undergraduate Program (HBCU-UP), which will fund Implementation Projects, Planning Projects, Education Research Projects and Targeted Infusion Projects for undergraduate science, technology, engineering and mathematics (STEM) degree programs. Approximately \$7 million in FY 2007 funding is anticipated, to be split between 17 awardees. Optional letters of intent are due November 14, 2006. Full proposals are due December 15, 2006. [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf06606](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf06606)

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*7. ONR BAA Includes UPS Requirement for Mobile Command and Control System*

The Office of Naval Research has issued a Broad Agency Announcement for Mobile Modular Command and Control (M2C2) Prototype Enhancement. Responses are sought to investigate the feasibility and practicability of improving technology developed and demonstrated under a previous BAA. Research areas include electrical power generation and management, as well as an uninterruptible power supply for computers and network equipment. Awards will take the form of Cost Plus Fixed Fee contracts. Deadline for proposals is November 21, 2006. <http://www.fbo.gov/spg/DON/ONR/ONR/BAA%2D07%2D003/Attachments.html>

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*8. DOE Science Office 2007 SBIR/STTR Solicitation Includes Hydrogen Program Area*

DOE's Office of Science issued its 2007 Small Business Innovation Research/Small Business Technology Transfer program solicitation, which includes a program area focused on Hydrogen Delivery and Production. Sub-topics are: Off-Board Hydrogen Bulk Storage; Hydrogen Liquefaction; Hydrogen Compression; and Hydrogen Production. Phase I grants will receive up to \$100,000. Approximately \$36 million is expected to be available for new Phase I awards under this solicitation. Deadline for proposals is November 21, 2006. <http://www.science.doe.gov/sbir/>

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*9. Fuel Cell Systems Included as Category in NextEnergy Lab Competition*

NextEnergy announced a Lab Competition, inviting teams to compete for a "start-up" award package valued at \$100,000. Qualifying categories of team plans include fuel cells and other alternative energy systems. The winning team will receive a \$25,000 cash infusion plus lab space, consulting assistance, marketing exposure and a variety of other business services worth another \$75,000. Applications are due by November 24, 2006. <http://www.nextenergy.org/nextenergycenter/LabCompetition.asp>

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**Contract / Funding Awards**  
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*10. FTA Awards \$49 Million in Grants for Hydrogen Fuel Cell Bus Development*

The Federal Transit Authority announced \$49 million in federal grants for projects to explore new ways to successfully commercialize hydrogen fuel cell buses. The grants were made possible through the National Fuel Cell Bus Technology Development Program, which was part of the recently enacted Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Among those selected to receive grants is the Washington Metropolitan Area Transit Authority, which will receive \$8.4 million to lead its project team in the development and in-service evaluation of hybrid fuel cell buses. [http://www.fta.dot.gov/news/news\\_events\\_5830.html](http://www.fta.dot.gov/news/news_events_5830.html)

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*11. Minority Universities Receive Fuel Cell Funding from DOE*

The Department of Energy's Office of Fossil Energy has awarded grants to four institutions through its Historically Black Colleges and Universities and Other Minority Institutions (HBCU/OMI) program. The four awards totaled \$715,000. Two of the projects will focus on low-temperature SOFCs and membranes for hydrogen separation.

[http://www.fossil.energy.gov/news/techlines/2006/06059-Minority\\_Universities\\_Receive\\_Gran.html](http://www.fossil.energy.gov/news/techlines/2006/06059-Minority_Universities_Receive_Gran.html)

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*12. PEDA Awards Grant for 2-MW Fuel Cell Power Plant Project*

The Pennsylvania Energy Development Authority (PEDA) granted HydroGen Corporation \$250,000 to support the application of a 2-MW fuel cell power plant in an industrial environment. HydroGen will work with U.S. Steel's Mon Valley Works on the project, which will use hydrogen-rich gases resulting from the steel-making process.

<http://www.hydrogenllc.net/hydrov2/>

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*13. Missile Defense Agency Awards \$1.25 Million for Fuel Cell Research*

The U.S. Missile Defense Agency (MDA) awarded a \$1.25 million follow-on-contract to Proton Energy Systems for continued development of regenerative fuel cell technology for high altitude airships. MDA says the prototype will demonstrate the engineering feasibility and potential utility of an unmanned, untethered, gas-filled airship that can fly at 70,000 feet.

<http://phx.corporate-ir.net/phoenix.zhtml?c=122665&p=irol-newsArticle&ID=915186&highlight=>

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*14. Air Force Places \$4.0 Order for Millennium Cell Fuel Cartridges*

The U.S. Air Force has placed a \$4.0 million order for Millennium Cell's sodium borohydride based fuel cartridge technology. The Air Force will use the technology to address higher energy density targets for future soldier power sources.

<http://www.millenniumcell.com/fw/main/default.asp?DocID=92&reqid=918025>

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*15. Greater Columbia Fuel Cell Challenge Selects Fuel Cell Providers*

The Greater Columbia "Fuel Cell Challenge" has selected Jadoo Power Systems and its technology partner, Millennium Cell, as providers of technology that will be integrated into multiple locations throughout the city and at the University of South Carolina. Sponsored projects include use of fuel cells by emergency responders as well as professional TV broadcasters.

<http://www.thomas-pr.com/pressreleases/jadoofuelcellchallengerelease.html>

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*16. NSF Awards \$76 Million for Science and Technology Centers*

The National Science Foundation has awarded \$76 million to fund multi-university collaborations in support of cross-disciplinary centers that address four areas: next-generation polymers, climate modeling, microbial oceanography and coastal environments. The NSF Science and Technology Center for Layered Polymeric Systems will be headquartered at Case Western Reserve University and will focus on a layering process that can combine otherwise incompatible polymers. The funding for the centers will be spread out over the next five years.

<http://www.ssti.org/Digest/2006/100906.htm#NSF>

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**State Activities**  
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*17. New York State Launches Project to Demonstrate Hydrogen from Hydropower*

New York Governor George E. Pataki announced plans for a \$21 million hydropower-to-hydrogen initiative. The hydrogen would fuel vehicles and transit buses, with potential sites at Niagara Falls State Park and at Western New York locations operated by the Niagara Frontier Transportation Authority. <http://www.ny.gov/governor/press/06/1004061.html>

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*18. Virginia Expands Systems Eligible for Net-Metering*

The Virginia State Corporation Commission has expanded the state's net-metering rules to include all systems that generate electricity using renewable energy, now defined as "energy derived from sunlight, wind, falling water, sustainable biomass, energy from waste, wave motion, tides, and geothermal power." The state allows residential customers with systems up to 10 kW and nonresidential customers with systems up to 500 kW to net meter.

<http://www.irecusa.org/connect/enewsletter.html>

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**Industry Headlines**  
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*19. Successful Field Trials in South Africa Lead to Follow-On Orders for Plug Power*

Successful field trials of Plug Power's GenCore® fuel cell system for a leading South African wireless provider have led to an order for 120 additional units to be installed at more than 30 cell phone site locations throughout South Africa. During the 6-month field trial, the fuel cell responded to 121 power failures at a wireless base station.

<http://www.plugpower.com>

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*20. Ford, BP Open Hydrogen Fueling Station in Taylor, Michigan*

Ford and BP opened a hydrogen fueling station in Taylor, Michigan, which will fuel a fleet of Ford Focus fuel cell vehicles being used by the city as official vehicles. Ford also announced it would begin deliveries of hydrogen-powered buses in late-2006.

<http://www.hydrogenforecast.com/ArticleDetails.php?articleID=335>

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*21. ReliOn Fuel Cell Receives CE Certification*

ReliOn has received CE approval for its T-1000™ and T-2000™ fuel cell products, which provide backup power between 600 Watts and 12 kilowatts to communications applications. The CE certification means a company has met all applicable performance and safety requirements for the European Union. <http://www.relion-inc.com/news.asp#18>

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*22. FuelCell Energy to Install Power Plant Running on Milk-Processing Waste*

FuelCell Energy announced it will supply a 750-kW Direct FuelCell® power plant to the city of Tulare, California, where it will be used to produce electricity using milk processing waste from large food processor plants. By purchasing the ultra-clean fuel cell power plant, the city does not have to purchase \$600,000 of Emission Reduction Credits, which would be required if the city had installed traditional on-site power equipment.

<http://www.fuelcellenergy.com/>

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**University Activities**  
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### 23. 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](mailto:khaq@nfcrc.uci.edu))

Charles Clark, director of corporate and government relations for the University of Akron; Martin Abraham, dean of the graduate school and professor of chemical and environmental engineering at the University of Toledo; and John Lannutti, professor of materials science and engineering at The Ohio State University are among the individuals recently elected to the board of directors of the Ohio Fuel Cell Coalition. [14-Sept-2006, *PR Newswire US*]

Scientists at the University of Illinois at Urbana-Champaign have designed and built ceramic microreactors for the on-site reforming of hydrocarbon fuels, such as propane, into hydrogen for use in fuel cells and other portable power sources. Applications include power supplies for small appliances and laptop computers, and on-site rechargers for battery packs used by the military. "The catalytic reforming of hydrocarbon fuels offers a nice solution to supplying hydrogen to fuel cells while avoiding safety and storage issues related to gaseous hydrogen," said Paul Kenis, a professor of chemical and biomolecular engineering at Illinois and corresponding author of a paper accepted for publication in the journal *Lab on a Chip*, and posted on its Web site. "The performance of our integrated, high-temperature microreactors surpasses that of other fuel reformer systems," Kenis said. "Our microreactors are superior in both hydrogen production and in long-term stability." Kenis and his group are now attempting to reform other, higher hydrocarbon fuels, such as gasoline and diesel. [25-Sept-2006, *Space Daily*]

Minhua Shao, a graduate student pursuing a Ph.D. in electrochemistry at Stony Brook University in New York, has won the second annual Dr. Mow Shiah Lin Scholarship. The Asian Pacific American Association at the U.S. Department of Energy's Brookhaven National Laboratory initiated the scholarship, which consists of \$1,000 and a plaque, to honor the late distinguished Brookhaven Lab scientist for which it is named. Shao, who earned a B.S. in chemistry in 1999 and a M.S. in electrochemistry in 2002, both from Xiamen University in China, currently works with senior chemist Radoslav Adzic at Brookhaven. Shao's research focuses on designing and developing platinum-free or low-platinum electrocatalysts that will significantly lower the cost of fuel cells. [06-Oct-2006, *Brookhaven National Laboratory*]

Jerry Y.S. Lin, professor and department chair of chemical engineering at Arizona State University in Tempe, recently was appointed to the board of directors for Alchemy Enterprises, Ltd. Dr. Lin — considered an expert in inorganic membranes, solid oxide fuel cells, adsorption and catalysis — also will chair the board's Technology Committee. Alchemy is an alternative energy company that is developing a new electric power cell technology it believes will generate and manage electricity to power a broad range of applications. [16-Oct-2006, *Business Wire*]

Researchers from the University of Minnesota-Rochester and Rochester Public Utilities are pairing a fuel cell and a geothermal heating/cooling system at a new laboratory at Quarry Hill Nature Center to find out how much better they are in tandem. Late this month, university researcher Jim Licari and three other university scientists start testing a research system housed at the lab. Electric utilities, the university, and heating and ventilating manufacturer Trane from La Crosse, Wis., are underwriting the \$147,000 project. If the Hybrid Energy System proves to be beneficial, it could be licensed to a commercial firm and produced for the home-heating market, said Jim Walters, RPU's customer relations director. The study itself should be done by the end of 2007 but could be extended six months depending upon discoveries along the way, Licari said. [18-Oct-2006, *Post-Bulletin* (Rochester, Minnesota)]

The U.S. Patent and Trademark Office has assigned a patent to Texas A&M University System, College Station, for a method of converting natural gas to olefins. The "process for converting natural gas to an olefin includes heating the gas to a selected range of temperature to convert a fraction of the gas stream to reactive hydrocarbons, primarily ethylene or acetylene, and reacting with hydrogen in the presence of a catalyst to produce the olefin, usually ethylene." An abstract

of the invention, released by the Patent Office, said: "A portion of the incoming natural gas may be used to heat the remainder of the natural gas to the selected range of temperature. Hydrogen resulting from the reactions may be used to make electricity in a fuel cell. Alternatively, hydrogen may be burned to heat the natural gas to the selected range of temperature." The process was developed by Kenneth R. Hall, Aydin Akgerman and Rayford G. Anthony, all from College Station, Texas, and Jerry A. Bullin and Philip T. Eubank, both of Bryan, Texas. They were issued U.S. Patent No. 7,119,240. [19-Oct-2006, *US Fed News*]

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**Administration**  
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Press releases and story ideas may be forwarded to Bernadette Geyer, editor, for consideration at [fuelcellconnection @ yahoo.com](mailto:fuelcellconnection@yahoo.com).

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**About Fuel Cell Connection**  
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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/>)

*National Energy Technology Laboratory* -- The National Energy Technology Laboratory is federally owned and operated. Its mission is "*We Solve National Energy and Environmental Problems.*" NETL performs, procures, and partners in technical research, development, and demonstration to advance technology into the commercial marketplace, thereby benefiting the environment, contributing to U.S. employment, and advancing the position of U.S. industries in the global market. (<http://www.netl.doe.gov>)