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**FUEL CELL CONNECTION - October 2008 Issue**  
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**News on U.S. Government Fuel Cell Programs**  
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1. DOE Study Says Commercializing Fuel Cells Could Generate 675,000 New Jobs by 2035

A study sent to Congress by the U.S. Department of Energy (DOE) estimates 675,000 new jobs could be created by 2035 as a result of commercializing fuel cells and shifting from gasoline to hydrogen. The study, "Effects of a Transition to a Hydrogen Economy on Employment in the United States," was ordered by Congress in 2005.

http://www.hydrogen.energy.gov/news_economy.html

2. Portable SOFCs Delivered to CERDEC for Testing

Five 25-watt SOFC systems were delivered by Adaptive Materials, Inc., to the U.S. Armed Services Communications-Electronics Research, Development and Engineering Center (CERDEC) for testing. Each of the Amie25 fuel cell systems is fueled by propane, weighs 1.5 kilograms, and has the potential to replace nine different types of batteries a soldier would carry onto the field. Each unit can run for 72 hours for each kilogram of propane.

<http://www.adaptivematerials.com/internal.php?sid=5&nid=46>

3. High-Temperature Electrolysis for Hydrogen Production Achieved by INL Researchers

Scientists at the Idaho National Laboratory (INL) successfully produced hydrogen via High-Temperature Electrolysis (HTE). The researchers produced hydrogen at a rate of 5.6 cubic meters per hour, using technology originally developed for solid oxide fuel cells.

https://inlportal.inl.gov/portal/server.pt?open=514&objID=1555&mode=2&featurestory=DA_150378

4. LBNL Scientists Observe Nanoparticles Changing Composition in Presence of Reactants

Using a state-of-the-art spectroscopy system, scientists at the Lawrence Berkeley National Laboratory (LBNL) observed catalytic nanoparticles as they changed composition in the presence of different reactants, including hydrogen. This is the first time scientists have been able to watch catalysts during a reaction.

<http://newscenter.lbl.gov/press-releases/2008/10/21/catalysts/>

5. EIA Report Projects Impacts of Increased Hydrogen Use

Responding to a request from Senator Byron Dorgan (D-ND), the DOE Energy Information Administration (EIA) has published a report titled "The Impact of Increased Use of Hydrogen on Petroleum Consumption and Carbon Dioxide Emissions." The "Less Aggressive" case scenario projects 37.1 percent reduction in petroleum consumption from light-duty vehicles in 2050, along with an 8.8 percent reduction in carbon dioxide emissions. The "More Aggressive" case scenario projects 84.1 percent reduction in petroleum consumption and 63.8 percent reduction in carbon dioxide emissions from light-duty vehicles in 2050.

<http://www.eia.doe.gov/oiaf/servicept/hydro/index.html>

6. PNNL Fuel Cell Researcher Receives 2008 Grove Medal

Subhash Singhal, fuel cell director at the Pacific Northwest National Laboratory (PNNL), has received the 2008 Grove Medal for sustained advances in fuel cell technology. Singhal received the award at the Fuel Cells Science & Technology 2008 conference in Copenhagen.
<http://www.pnl.gov/news/release.asp?id=330>

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**RFP/Solicitation News**  
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7. EPA Announces 6th Annual P3 Awards for Student Sustainability Projects

The U.S. Environmental Protection Agency (EPA) announced its 6th Annual P3 Awards: A National Student Competition for Sustainability Focusing on People, Prosperity, and the Planet. Eligible applicants are U.S.-based non-profit public or private colleges, universities or other non-profit degree-granting organizations/institutions, to support teams of undergraduate and/or graduate students. Topics for research include Energy and Materials & Chemicals. Approximately \$500,000 is available under this announcement for an estimated 50 Phase I awards of up to \$10,000. Successful Phase I projects will be eligible to receive additional Phase II funding. Deadline for applications is December 23, 2008.

http://es.epa.gov/ncer/rfa/2009/2009_p3.html

8. NSF Issues 2009 STTR Program Solicitation

The National Science Foundation (NSF) has issued its 2009 Small Business Technology Transfer (STTR) Program solicitation, which includes a variety of hydrogen and fuel cell sub-topics. STTR Phase I awards are for up to \$150,000 for a 12-month project. The program expects to make approximately 35 awards under this solicitation. A Letter of Intent is required and due by January 14, 2009. The deadline for full proposals is February 25, 2009.

http://www.nsf.gov/publications/pub_summ.jsp?org=IIP&ods_key=nsf08608

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**Contract / Funding Awards**  
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9. DOE Selects New Hydrogen Storage Engineering Center of Excellence

A team led by Savannah River National Laboratory has been selected by DOE for negotiation of cost-shared awards to participate in a new Hydrogen Storage Engineering Center of Excellence. DOE expects to provide up to \$6 million in FY2009 for the projects, which will be incorporated into the National Hydrogen Storage Project.

http://www.hydrogen.energy.gov/news_doe_selects.html

10. CCEF Selects Five Fuel Cell Projects for Round 3 of Project 150

The Connecticut Clean Energy Fund (CCEF) has selected five fuel cell projects for recommendation to the state's Department of Public Utility Control for consideration of a long-term Electric Purchase Agreement under Round 3 of Project 150. Project 150 was launched to encourage and assist in the financing of large renewable energy projects that would benefit Connecticut ratepayers.

http://www.ctcleanenergy.com/NewsEvents/PressRoom/tabid/118/ctl/ViewItem/mid/1364/ItemId/129/Default.aspx?SkinSrc=/Portals/_default/Skins/subpages/subpage_level0

11. ARB Awards \$7.6 Million for New Hydrogen Stations

The California Air Resources Board (ARB) has awarded \$7.6 million for three new hydrogen fueling stations under the Hydrogen Highway initiative. Two stations are in the greater Los Angeles area and the other is near Oakland. All three stations are expected to be fully operational by the end of 2009.

<http://www.californiahydrogen.org/page.cfm?content=20&display=90>

12. Navy Announces Awards for Novel Materials for Solid Hydrogen Storage

The U.S. Navy's Naval Surface Warfare Center has announced three contract awards under a solicitation titled "R&D for Novel Materials for Solid Hydrogen Storage." Trulite, Inc. will receive \$531,039; the University of California will receive \$434,135; and the University of Missouri will receive \$592,607.

<https://www.fbo.gov/index?s=opportunity&mode=form&tab=core&id=7f57aa68bfc78045d48a784af44537fd&cvview=0>

13. Navy Selects Versa Power SOFCs for Testing, Analysis

The Naval Undersea Warfare Center Division Newport (NUWCDIVNPT) announced it intends to place a purchase order to Versa Power Systems for delivery of two 28-cell SOFC stacks for testing, engineering support and to set up and initiate the tests and "post run" stack analysis. The SOFCs were developed through the DOE Solid State Energy Conversion Alliance (SECA) program. It is expected that NUWCDIVNPT will test a variety of SOFC stacks being developed through the SECA program.

<https://www.fbo.gov/index?s=opportunity&mode=form&id=b382a5489a3c234345d011cb76a903fb&tab=core&cvview=1>

14. Army Awards Fuel Cell Contract for Silent Camp™ Operation

The U.S. Army's Engineer Research and Development Center (ERDC) awarded a \$2.62 million contract to Proton Energy Systems to develop a regenerative fuel cell system for "Silent Camp™" Operation, which will integrate the fuel cell with a traditional power source.

<http://www.protonenergy.com/news.php>

15. DuPont/Smart Fuel Cell Team Wins DOD Wearable Power Prize Competition

The Department of Defense (DOD) awarded the \$1 million top prize in its Wearable Power Prize competition to the DuPont/Smart Fuel Cell (SFC) team, which designed and built the lightest wearable power system for soldiers in the field. The team's system provided an average of 20 watts of power for more than 96 hours and weighed less than 8.8 pounds.

<http://www.defenselink.mil/releases/release.aspx?releaseid=12265>

16. NSF Awards \$92.5 Million for Engineering Research Centers

The National Science Foundation (NSF) awarded \$92.5 million for the establishment of five new university-based Engineering Research Centers (ERCs), including the NSF ERC for Future Renewable Electric Energy Delivery and Management, which will develop technologies to help integrate fuel cells and other distributed energy sources into the centralized power grid.

http://www.nsf.gov/news/news_summ.jsp?cntn_id=112313&org=NSF&from=news

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**Legislative/Regulatory News**  
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17. Economic Stabilization Act Includes Extension and Increase of Fuel Cell Tax Credit

On Sept. 18, Patent No. WO/2008/110176 was awarded to Booki Min of Vanlose, Denmark, and Irini Angelidaki of Frederiksberg, Denmark, for development of a microbial fuel cell. The patent was assigned to the Technical University of Denmark in Lyngby. According to an abstract posted by the World Intellectual Property Organization, the invention consists of "a novel microbial fuel cell construction for the generation of electrical energy. The microbial fuel cell comprises: (i) an anode electrode, (ii) a cathode chamber, said cathode chamber comprising an inlet through which an influent enters the cathode chamber, an outlet through which an effluent departs the cathode chamber, a cathode electrode and an electrolyte permeable membrane, wherein both the anode electrode and the cathode chamber are to be submersed into an anaerobic environment to generate electrical energy."

<http://www.wipo.int/pctdb/en/ia.jsp?ia=DK2008/050060>

Northern Illinois University's College of Engineering and Engineering Technology has received a \$1 million grant to help the American railroad industry find ways to squeeze more miles from a gallon of fuel and reduce the pollution produced by locomotives. The grant, from the U.S. Department of Energy, has launched a college-wide effort that will examine options ranging from developing improved lubricants for locomotives and rails to harnessing the power of fuel cells to eliminate diesel engines altogether.

<http://www.niu.edu/northerntoday/2008/sept22/locomotive.shtml>

Five hydrogen powered cars have been unveiled at the University of Birmingham, making it the only university in the United Kingdom to run a fleet of vehicles powered in this manner. The vehicles, designed and built by Microcab Ltd, are being used in a study by the University's School of Chemical Engineering to find out more about the viability of hydrogen in transport applications.

<http://www.newscentre.bham.ac.uk/press/2008/09/23Sep085carannouncement.shtml>

The Center for Electrochemistry at The University of Texas at Austin has received a \$5 million grant from the Houston-based Welch Foundation to start the Renewable Energy Initiative, a multidisciplinary, collaborative effort to promote advances in renewable energy technologies. The initiative has three central research thrusts, one of which will explore the fundamental chemistry of electrocatalysts, with an eye toward developing better catalysts for fuel cells and water electrolysis.

http://www.utexas.edu/news/2008/10/01/cec_welch/

Researchers in the College of Engineering at Oregon State University have developed a new approach for using several types of biowaste, including ordinary municipal sewage, to produce hydrogen at a much lower cost than the traditional electrolysis technology. "In the laboratory we're already quite close to the Department of Energy hydrogen cost goal of \$2 to \$3 per gasoline gallon equivalent, or GGE," said Hong Liu, an OSU assistant professor of biological and ecological engineering. "And with some additional research it should be possible to scale these systems up to levels needed for commercial use."

<http://oregonstate.edu/dept/ncs/newsarch/2008/Oct08/sewage.html>

A hydrogen-powered fuel cell is powering a home in England under a partnership between Black Country Housing Group and the University of Birmingham. The university is leading the research project to learn more about hydrogen and fuel cells in a domestic context. The fuel cell is a Baxi Innotech unit that generates 1.5 kilowatts of electricity and provides 3 kilowatts of heat suitable for domestic heating and hot water that is transferred to a 600-litre water tank heat store next to the fuel cell.

http://www.newscentre.bham.ac.uk/press/2008/10/Hydro_House_Press_Release_10_10_08.shtml

Blogger "Hydro Kevin" writes in an Oct. 10 posting in *Hydrogen Cars and Vehicles* that researchers at Oxford University in the United Kingdom have identified a mushroom enzyme called "laccase" that could replace platinum and other precious metals in fuel cells. The fungi fuel

cell would be more efficient than traditional metal catalyst fuel cells in speeding up the chemical reactions. <http://www.hydrogencarsnow.com/blog2/>

Jingguang Chen, Claire D. LeClaire Professor of Chemical Engineering at the University of Delaware, and colleagues at the Dalian Institute of Chemical Physics in China have discovered a novel way to directly convert cellulose to industrially useful chemical compounds using tungsten carbide as a catalyst. Chen and his research group at UD have been investigating the use of tungsten carbide as an alternative to more expensive platinum-based catalysts for more than a decade, and they have demonstrated the utility of these materials for fuel cell applications. More recently, the researchers started to explore their use for the conversion of oxygenate and biomass molecules. <http://www.udel.edu/udaily/2009/oct/biomass101408.html>

Chemists at the New University of Lisbon in Portugal have created what they call an ion jelly that could make a range of electrochemical devices, including batteries, fuel cells and solar cells, cheaper and more environmentally friendly. <http://technology.newscientist.com/article/dn14975-ion-jelly-could-satisfy-appetite-for-greener-batteries.html>

A research team from the School of Engineering at the University of Alabama at Birmingham is part of a new project to design, manufacture, demonstrate and evaluate a hydrogen fuel cell bus that will be operated by the Birmingham-Jefferson County Transit Authority. The Center for Transportation and the Environment is coordinating the research project that is funded in part by the Federal Transit Administration. Five other teams, including one from Auburn University, also are playing critical roles in the project. <http://main.uab.edu/Sites/MediaRelations/articles/53488/>

A Titan 80-300 Cubed, described as “the world's most advanced and powerful electron microscope,” was installed at the new Canadian Centre for Electron Microscopy at McMaster University in Ontario in the summer. *The Globe and Mail* reported in its Oct. 15 edition that researchers from across the country will have access to the microscope, and already have plans to use it on a variety of projects, including the development of more efficient batteries and fuel cells. <http://dailynews.mcmaster.ca/story.cfm?id=5725>

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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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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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