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FUEL CELL CONNECTION - February 2009 Issue

IN THIS ISSUE

- * Economic Stimulus Act Includes Support for Fuel Cell, Hydrogen Projects
- * DOE Publishes Reports for Congress on Fuel Cell Activities, School Buses
- * DOE Issues RFI on Hydrogen, Fuel Cell Early Market and Deployment Opportunities
- * SECA Selects Two Projects for Next-Phase Funding
- * Protonex Launches Soldier-Worn Fuel Cell Power Managers

CONTENTS

News on U.S. Government Fuel Cell Programs

1. DOE Publishes Reports for Congress on Fuel Cell Activities, School Buses
2. Mobile Alternative Fueling Station Locator Now Available for Drivers
3. DOE Hydrogen Program Annual Merit Review Meeting Set for May

RFP / Solicitation News

4. Advanced Technologies and Strategies Sought for Water Reuse and Desalination Facilities
5. NSWCCD Seeks Technical Services for Electrochemical Power Sources
6. DOE Issues RFI on Hydrogen, Fuel Cell Early Market and Deployment Opportunities
7. DOE Issues FOA for SBIR/STTR Phase II Grants

Contract / Funding Awards

8. SECA Selects Two Projects for Next-Phase Funding
9. Projects Selected to Enable Industrial Use of Alternative Fuels
10. TACOM to Support Continued Design & Development of Turbo Fuel Cell Engine
11. Army Signs Agreement for Installation of Fuel Cell Backup Power Units at Fort Jackson

Legislative / Regulatory News

12. Economic Stimulus Act Includes Support for Fuel Cell, Hydrogen Projects
13. President Obama Issues Orders on Automobile Fuel Economy, GHG Emissions
14. IREC Creates Map of Interconnection Liability Insurance Requirements

Industry Headlines

15. Protonex Launches Soldier-Worn Fuel Cell Power Managers
16. SFC Smart Fuel Cell Launches Portable Fuel Cell System for Defense Applications

University Activities

17. University Fuel Cell Roundup

Administration

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**News on U.S. Government Fuel Cell Programs**  
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1. DOE Publishes Reports for Congress on Fuel Cell Activities, School Buses

The U.S. Department of Energy (DOE) has published two new fuel cell reports for Congress, fulfilling requirements of the 2005 Energy Policy Act. The first, *Hydrogen and Fuel Cell Activities, Progress, and Plans Report to Congress* describes progress on the DOE Hydrogen Program's research, development and demonstration activities. The second report, *Fuel Cell School Buses Report to Congress*, examines the potential for a program to develop, demonstrate and assess converting natural gas infrastructure to support the use of fuel cell school buses.

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

2. Mobile Alternative Fueling Station Locator Now Available for Drivers

Drivers of alternative fuel vehicles now have the ability to find the five closest biodiesel, electricity, ethanol, hydrogen, natural gas and propane fueling sites, thanks to the Mobile Alternative Fueling Station Locator. The Locator, developed by the National Renewable Energy Laboratory and sponsored by the Clean Cities Initiative, can be accessed using a cell phone, BlackBerry, or other personal digital assistant (PDA).

<http://www.afdc.energy.gov/afdc/locator/m/station/>

3. DOE Hydrogen Program Annual Merit Review Meeting Set for May

The Annual Merit Review Meeting for the DOE Hydrogen Program and Vehicle Technologies Program is scheduled for May 18-22, 2009, in Arlington, Virginia. This is the first time the two programs will jointly hold a merit review meeting. A web site has been set up specifically for the meeting, featuring registration and hotel information as well as information for both oral and poster presenters. <http://annualmeritreview.energy.gov/>

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**RFP/Solicitation News**  
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4. Advanced Technologies and Strategies Sought for Water Reuse and Desalination Facilities

The WaterReuse Foundation has issued a Request for Proposals (RFP) titled "Renewable Energy Technologies and Energy Efficiency Strategies: Guidelines for Water Desalination and Reuse Systems to Optimize Energy Use and Reduce Greenhouse Gas Emissions." The objective is to provide advanced water treatment facility managers "information on ways to increase the use of renewable energy resources, develop management strategies to reduce peak power use, optimize advanced treatment technologies to save on energy and costs, and reduce the overall output of greenhouse gases (GHG) at water and wastewater utilities." The Foundation has allotted a maximum \$200,000 for this project. Proposals are due March 10, 2009.

http://www.watereuse.org/files/images/RFP_WRF-08-13_0.pdf

5. NSWCCD Seeks Technical Services for Electrochemical Power Sources

The Naval Surface Warfare Center Carderock Division (NSWCCD) issued a solicitation for technical services in the field of "electrochemical power sources," including fuel cells, batteries, capacitors and chemistries. The contractor will provide services to support the "characterization,

construction, test and evaluation” of these types of power sources, which will be provided to the contractor by the government. Deadline for responses is March 25, 2009.

https://www.fbo.gov/index?s=opportunity&mode=form&tab=core&id=9b85505342adf55ac95a2992123c8f06&_cview=0

6. DOE Issues RFI on Hydrogen, Fuel Cell Early Market and Deployment Opportunities

DOE has issued a “Hydrogen and Fuel Cell Market Transformation” Request for Information (RFI) that seeks stakeholder and public input on potential early markets and deployment opportunities for hydrogen and fuel cell technologies. Topics include Combined Heat and Power (CHP) Fuel Cell Systems and Analysis of Excess and/or Waste Hydrogen Sources. Comments are due March 31, 2009. <https://e-center.doe.gov/iips/faopor.nsf/UNID/5589E5EC2959756385257553006E80C1?OpenDocument>

7. DOE Issues FOA for SBIR/STTR Phase II Grants

DOE has issued a Funding Opportunity Notice (FOA) for FY 2009 Small Business Innovation Research/Technology Transfer (SBIR/STTR) Phase II Grant Applications. Only Phase I Awardees from FY 2008 are invited to submit grant applications under this FOA. Approximately \$104 million is expected to be available under this announcement, with individual award ceilings of \$750,000. Applications are due April 17, 2009.

<http://www.science.doe.gov/sbir/submission/submission09.pdf>

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**Contract / Funding Awards**  
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8. SECA Selects Two Projects for Next-Phase Funding

The DOE Solid-State Energy Conversion Alliance (SECA) Program has awarded a Phase II contract to FuelCell Energy for a project to build a minimum 25-kW SOFC stack to be integrated into a larger “proof-of-concept system” that will operate on coal-based syngas. The SECA Program also awarded a Phase II award to Siemens Energy for improvements to its 10-kW SOFC stack.

http://www.fossil.energy.gov/news/techlines/2009/09004-SECA_Projects_Move_Forward.html

9. Projects Selected to Enable Industrial Use of Alternative Fuels

The DOE Industrial Technologies Program recently announced awards totaling \$30 million over four years for projects to develop technologies to provide alternative fuel use options for manufacturers. Seven projects will receive funding through the current DOE appropriation, while an additional ten have been selected, contingent on appropriations for FY2009 and beyond. Of the latter ten projects, three focus on use of fuel cells.

http://www1.eere.energy.gov/industry/newsandevents/news_detail.html?news_id=12203

10. TACOM to Support Continued Design & Development of Turbo Fuel Cell Engine

The U.S. Army Tank-Automotive Command (TACOM) announced its intention to negotiate a Sole Source agreement with Pittsburgh Electric Engines, Inc. (PEEI) for continued design and development of a Turbo Fuel Cell Engine. The work will include assembly, testing, demonstration, computer modeling and validation through testing of an SOFC stack with an output of 3-6 kW. The negotiation is expected to result in a “cost-plus-fixed-fee modification” to an existing contract between TACOM and PEEI.

https://www.fbo.gov/index?s=opportunity&mode=form&id=9384447eb438bb0e658f0c5b5903ef70&tab=core&_cview=0

11. Army Signs Agreement for Installation of Fuel Cell Backup Power Units at Fort Jackson
The U.S. Army Corps of Engineers has signed a cooperative agreement with the Advanced Technology Institute (ATI) for installation of ten fuel cell backup power units in three mission-critical applications at Fort Jackson, South Carolina. Partners in the project are ATI's parent organization, South Carolina Research Authority, and the U.S. Department of Energy. The fuel cells will provide backup power to a Telecommunications Center, Energy Monitoring and Control Facility, and Emergency Services Center.
http://www.aticorp.org/press/pres_fuelcells.pdf

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**Legislative / Regulatory News**  
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12. Economic Stimulus Act Includes Support for Fuel Cell, Hydrogen Projects
President Barack Obama signed the American Recovery and Reinvestment Act of 2009, which includes project funding and tax incentives that could benefit the fuel cell and hydrogen community. In spending, the Act provides \$75 million for Army, Navy, Air Force and Defense-Wide RDT&E programs, with language specifying fuel cells as eligible for funding. The Act also provides \$16.8 billion for the DOE Office of Energy Efficiency and Renewable Energy, with \$2.5 billion steered towards applied research, development, demonstration and deployment activities. \$3.2 billion of EERE funds is specified by the Act to go toward Energy Efficiency and Conservation Block Grants for projects including fuel cell installations and energy audit programs. In the tax credit section of the Act, caps were removed on the tax credit which equals 30% of the cost of qualified fuel cell systems, solar energy systems and other renewable energy generating technologies. The Act also increases to \$200,000 the maximum credit to businesses for installing hydrogen refueling stations, and creates a new 30% investment tax credit for projects that establish, re-equip, or expand manufacturing facilities for fuel cells, smart grid technologies, and a wide range of other renewable and energy efficient technologies.
<http://www.recovery.gov/>

13. President Obama Issues Orders on Automobile Fuel Economy, GHG Emissions
President Barack Obama issued two memoranda to improve fuel economy and reduce greenhouse gas emissions for American automobiles. One of the memoranda directs the secretary of transportation to publish higher fuel economy standards for model year 2011 cars and light trucks by the end of March 2009. The other memorandum directs the U.S. Environmental Protection Agency (EPA) to revisit a waiver request that would allow the state of California to implement its own greenhouse gas emission rules for vehicles.
http://www.whitehouse.gov/the_press_office/Presidential_Memorandum_fuel_economy/
http://www.whitehouse.gov/the_press_office/Presidential_Memorandum_EPA_Waiver/

14. IREC Creates Map of Interconnection Liability Insurance Requirements
The Interstate Renewable Energy Council (IREC) has created a helpful resource showing current state requirements regarding additional liability insurance for customer-generators trying to connect to an electric grid for the purposes of net metering. For example, Hawaii exempts systems 10 kW and under from additional liability insurance, but does not provide specific requirements for larger systems.
http://www.irecusa.org/index.php?id=56&tx_ttnews%5bpS%5d=1234286098&tx_ttnews%5btt_news%5d=1338&tx_ttnews%5bbackPid%5d=31&cHash=5e0feba258

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**Industry News**  
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15. Protonex Launches Soldier-Worn Fuel Cell Power Managers

Protonex launched its soldier-worn fuel cell power managers, SPM-611 and SPM-612, which have the ability to “harvest and scavenge” from alternative and found energy sources. The systems were demonstrated at the Association of the U.S. Army (AUSA) Winter Symposium in Ft. Lauderdale, Florida.

http://www.protonex.com/downloads/press-releases/2-17-09_SPM-Launch_FINAL.pdf

16. SFC Smart Fuel Cell Launches Portable Fuel Cell System for Defense Applications

SFC Smart Fuel Cell announced the commercial launch of its JENNY portable fuel cell system for defense applications. The system, which is expected to “reduce a soldier’s weight load up to 80 percent compared to carrying conventional lithium-ion batteries,” operates on methanol fuel.

<http://www.sfc.com/en/sfc-press-release/11087-internationaler-verkaufsstart-der-tragbaren-jenny-brennstoffzelle.html>

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**University Activities**  
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17. 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)

Jiaxing Huang, assistant professor of materials science and engineering at Northwestern University, and his research group have investigated how graphite-oxide sheets interact edge-to-edge and now hope to study face-to-face contact of the graphene-based materials. Huang hopes to find a way to stack the single-atom-thick graphene without making graphite, which could create functional materials for energy-related applications such as electrodes for batteries, ultracapacitors and fuel cells. This research is discussed in the cover article in the Jan. 26 issue of the *Journal of the American Chemical Society*.

<http://www.mccormick.northwestern.edu/news/articles/464>

General Motors Corp. and the U.S. Department of Energy recently announced that the Missouri University of Science and Technology will be the only U.S. university to receive GM's new fuel cell power train as part of EcoCAR, North America's premier collegiate automotive engineering.

http://news.mst.edu/2009/01/students_to_reengineer_gm_car.html

Professor Niels de Jonge and colleagues at Vanderbilt University and Oak Ridge National Laboratory have developed a technique for imaging whole cells in liquid with a scanning transmission electron microscope. The technique, which primarily will be used to evaluate biological systems and materials, will also become a resource for energy science, as researchers use it to visualize processes that occur at liquid: solid interfaces, for example, in lithium ion batteries, fuel cells, or catalytic reactions.

<http://www.mc.vanderbilt.edu/news/releases.php?release=489>

A team of scientists at the U.S. Department of Energy’s Brookhaven National Laboratory, in collaboration with researchers from the University of Delaware and Yeshiva University, has developed a new catalyst that could make ethanol-powered fuel cells feasible. The highly efficient catalyst performs two crucial and previously unreachable steps needed to oxidize ethanol and

produce clean energy in fuel cell reactions. Their results are published online in the January 25, 2009 edition of *Nature Materials*.

http://www.bnl.gov/bnlweb/pubaf/pr/PR_display.asp?prID=898

Jeffrey Allen, an assistant professor of mechanical engineering and engineering mechanics at Michigan Technological University, has been selected to receive a 2009 Ralph R. Teetor Educational Award from the Society of Automotive Engineers. The award recognizes excellence in teaching and honors younger educators who are successfully preparing engineers to meet society's challenges. Allen is associate director of the Advanced Power Systems Research Center and teaches courses in thermodynamics and fluid mechanics. He conducts research in energy conversion, particularly within fuel cells; microfluidics and capillarity; and optical diagnostics. http://www.admin.mtu.edu/urel/news/media_relations/789/

Rice University researchers have created hybrid carbon nanotube metal oxide arrays as electrode material that may improve the performance of lithium-ion batteries. Electrochemical capacitors and fuel cells would also benefit, the researchers said. The proof-of-concept research in which nanotubes are grown to look – and act – like the coaxial conducting lines used in cables is described in the online version of the American Chemical Society's *Nano Letters*.

<http://www.media.rice.edu/media/NewsBot.asp?MODE=VIEW&ID=12094&SnID=149899391>

or|

www.pubs.acs.org/action/doSearch?searchText=arava&searchSub=Search&publication=40026042

Northwestern University chemist Mercuri G. Kanatzidis, together with postdoctoral research associate Gerasimos S. Armatas, has developed a class of new porous materials, structured like a honeycomb, that is very effective at separating hydrogen from complex gas mixtures. The materials exhibit the best selectivity in separating hydrogen from carbon dioxide and methane, to the best of the researchers' knowledge. The researchers' work is presented online in the journal *Nature Materials*. Armatas is now with the University of Crete in Greece.

<http://www.northwestern.edu/newscenter/stories/2009/02/hydrogen.html>

Liming Dai, the University of Dayton's Wright Brothers Institute endowed chair in nanomaterials, and fellow scientists have taken a step toward a more efficient fuel cell that can be affordably mass-produced. They found that carbon nanotubes containing nitrogen are cheaper and work better than platinum in providing long-term fuel cell power.

http://news.udayton.edu/News_Article/?contentId=22582

Marcella Nehrbass, an engineering studies major at Lafayette College, explored the possibility of using hydrogen fuel as an alternative to petroleum with Javad Tavakoli, professor of chemical engineering. She discusses her research on the school's Website.

<http://www.lafayette.edu/news.php/view/13202>

Working with a grant from the South Carolina Research Authority, faculty members from the University of South Carolina's College of Engineering and Computing have devised a method by which the scoreboard at the new Carolina Baseball Stadium will be partly powered by a hydrogen fuel cell. The university's Green Quad residence hall currently uses a fuel cell to provide hot water. <http://uscnews.sc.edu/2009/02202009-RSRC054.html>

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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/>)

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