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**FUEL CELL CONNECTION - September 2008 Issue**  
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## News on U.S. Government Fuel Cell Programs

### 1. NC State Collaborates with ARS on Hydrogen-Producing Bacteria

Researchers at North Carolina State University and the Agricultural Research Service (ARS) are collaborating on research into nitrogen-fixing bacteria, which live in soil and on certain plant roots, to find strains of the bacteria which produce hydrogen gas. By using a "selecting agent" to identify the hydrogen-producing strains, researchers have an alternative to genomic sequencing or genetic modification. <http://www.ars.usda.gov/is/pr/2008/080825.htm>

### 2. ANL Collaborates to Extract Hydrogen from Contaminant in Unrefined Oil

Researchers at Argonne National Laboratory (ANL), in collaboration with Kingston Process Metallurgy, have invented a molten copper reactor, a process technology to extract and reuse pure hydrogen from the hydrogen sulfide that contaminates unrefined oil. The researchers plan to scale up their experimental work to further test the process, with a goal of developing a pilot scale reactor. [http://www.anl.gov/Media\\_Center/News/2008/ES080822.html](http://www.anl.gov/Media_Center/News/2008/ES080822.html)

### 3. PNNL Scientists Identify Cyanobacteria Chromosomes for Biofuel Production

Using DNA sequencing, scientists at Pacific Northwest National Laboratory (PNNL) have identified a cluster of nine genes that allow the *Cyanobacteria* 51142 bacteria to make ethanol, hydrogen, acetate and other compounds. The *Cyanobacteria* 51142 is one of the types of Cyanobacteria being investigated for use in biofuels production. <http://www.pnl.gov/news/release.asp?id=327>

### 4. ANL Scientists Find Nanoparticles Responsible for Alloy Corrosion

Argonne National Laboratory (ANL) scientists have found that carbon-bearing molecules can "sneak through" networks of iron and nickel nanoparticles embedded within oxide scales that develop on metal alloys at high temperatures, leading to brittleness and corrosion of the alloy. Based on these findings, ANL has developed new alloys without the nanoparticles. The discovery could affect alloy development and surface coatings for high temperature fuel cells. [http://www.anl.gov/Media\\_Center/News/2008/news080804.html](http://www.anl.gov/Media_Center/News/2008/news080804.html)

### 5. NSF to Establish \$18.5 Million Center for Green Grid Technologies

The National Science Foundation (NSF) is establishing a new Engineering Research Center (ERC) at North Carolina State University which will focus on technologies that can integrate renewable energy and energy storage systems into the power grid. The NSF ERC for Future Renewable Electric Energy Delivery and Management Systems (FREEDM systems), will develop a new distributed power grid network that will allow any combination and scale of energy sources or storage devices to be connected to the grid using standard interface "modules." NSF plans to invest a total of \$18.5 million in the ERC over a five-year period. [http://www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=112179](http://www.nsf.gov/news/news_summ.jsp?cntn_id=112179)

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*6. EPA Joins Project Driveway, Will Demonstrate Fuel Cell Equinox*

The U.S. Environmental Protection Agency (EPA) has received delivery of a Chevy Equinox Fuel Cell electric vehicle as part of Chevrolet's Project Driveway. As a participant in Project Driveway, EPA will use the fuel cell vehicle to conduct business in Washington, D.C., while allowing on-board devices to track real-world performance data of the vehicle.

<http://media.gm.com/servlet/GatewayServlet?target=http://image.emerald.gm.com/gmnews/viewpressreldetail.do?domain=2&docid=48520>

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RFP/Solicitation News
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*7. NIST Solicits Topic Ideas for Future Technology Solicitations*

The National Institute of Standards and Technology (NIST) is accepting suggestions on important "national and societal needs that could be addressed by transformative new technologies." NIST will consider all suggestions for incorporation into future solicitations under the NIST Technology Innovation Program (TIP). Interested parties must submit suggestions in the form of white papers. Deadline for submissions is November 1, 2008.

[http://www.nist.gov/public\\_affairs/techbeat/tb2008\\_0916.htm#whitepaper](http://www.nist.gov/public_affairs/techbeat/tb2008_0916.htm#whitepaper)

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*8. ONR Issues Solicitation for a Detailed Design for an SOFC-Based APU*

The Office of Naval Research (ONR) has issued a solicitation for a Detailed Design for a High Temperature Fuel Cell (SOFC) Based Auxiliary Power Unit (APU). The APU should be capable of operating with JP5, JP8, Ultra Low Sulfur Diesel and zero sulfur synthetic fuel. Presentations are available online from a prior "Industry Day" held for this solicitation. A total budget of \$3.2 million is estimated to be available for this solicitation, with individual awards not expected to exceed \$1.6 million each. Deadline for responses is November 10, 2008.

[https://www.fbo.gov/index?s=opportunity&mode=form&id=56a1fe12fc5fc2c6e4aefb6812658970&tab=core&\\_cview=0&cck=1&au=&ck=](https://www.fbo.gov/index?s=opportunity&mode=form&id=56a1fe12fc5fc2c6e4aefb6812658970&tab=core&_cview=0&cck=1&au=&ck=)

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*9. DARPA Issues Coal-to-Liquids BAA*

The Defense Advanced Research Projects Agency (DARPA) has issued a Coal-to-Liquids (CTL) Broad Agency Announcement (BAA) to support research into use of technologies that are environmentally friendly and cost competitive with petroleum based fuels. A total of \$4.56 million is available for awards under this solicitation. Multiple awards are anticipated. Proposals are due November 12, 2008.

[https://www.fbo.gov/index?s=opportunity&mode=form&id=8226e0da6edf77f9c80016717c55bf21&tab=core&\\_cview=0](https://www.fbo.gov/index?s=opportunity&mode=form&id=8226e0da6edf77f9c80016717c55bf21&tab=core&_cview=0)

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*10. DOE SBIR/STTR Solicitation Includes Fuel Cell, Hydrogen Topics*

The U.S. Department of Energy (DOE) has released its Small Business Innovation Research/Technology Transfer (SBIR/STTR) solicitation, which includes "Hydrogen, Fuel Cells, and Infrastructure Technologies" as a topic of interest. Phase I grants are up to \$100,000 each. Only successful Phase I projects will be eligible to apply for Phase II funding. The deadline for Phase I grant applications is November 20, 2008.

<http://www.science.doe.gov/sbir/>

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*11. \$8 Billion in Loan Guarantees Offered for Clean Coal Technologies*

DOE announced a solicitation for the third round of loan guarantees for projects that use advanced technologies in the areas of coal-based power generation, industrial gasification, and advanced coal gasification facilities. \$2 billion in loan guarantees under this solicitation will be made available specifically for advanced coal gasification projects that convert coal into electricity, hydrogen, and other energy products, while sequestering pollutant emissions. The application for this solicitation is broken into two parts. Deadline for submissions of Part I is December 22, 2008. Part II submissions are due March 23, 2009.

[http://www.fossil.energy.gov/news/techlines/2008/08047-DOE\\_Announces\\_Loan\\_Guarantees.html](http://www.fossil.energy.gov/news/techlines/2008/08047-DOE_Announces_Loan_Guarantees.html)

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*12. BAA Issued by ONR for Long-Range Science and Technology Projects*

The Office of Naval Research (ONR) has issued a Broad Agency Announcement (BAA) soliciting proposals for Long-Range Science and Technology Projects that have the potential to advance and improve Navy and Marine Corps operations. Potential offerors are strongly encouraged to contact the ONR Science and Technology Department that best matches their field of interest. Work funded may include basic research, applied research and some technology development, with awards taking the form of contracts, grants, cooperative agreements, or other transaction agreements. Offerors should consult the appropriate ONR Program Officer to determine whether a White Paper is desired before submitting a full proposal. Proposals will be accepted under this BAA until September 30, 2009, or until it is replaced by a successor BAA.

[https://www.fbo.gov/index?s=opportunity&mode=form&id=3f11f8e51f03d6e210c919a095b80aa7&tab=core&\\_cvview=0](https://www.fbo.gov/index?s=opportunity&mode=form&id=3f11f8e51f03d6e210c919a095b80aa7&tab=core&_cvview=0)

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*13. New York Provides Manufacturing Incentives for Renewable, Clean Energy Companies*

The New York State Energy Research and Development Authority (NYSERDA) has issued a Program Opportunity Notice (PON) titled "Renewable, Clean Energy, and Energy Efficiency Product Manufacturing Incentive Program." The PON provides incentives for companies to build manufacturing plants and producing clean energy products in New York State. Approximately \$10 million is available under this solicitation with a maximum funding of \$1.5 million per project. Proposals will be accepted through June 30, 2011, or until funds run out, whichever occurs first.

<http://www.nyserda.org/funding/1176pon.asp>

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Contract / Funding Awards
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*14. USDA Announces \$35 Million in Grants and Loan Guarantees for Energy Projects*

The U.S. Department of Agriculture (USDA) announced the recipients of \$35 million in grants and loan guarantees for renewable energy and energy efficiency projects. According to the USDA press release, funding will provide support for a wide range of technologies utilizing biomass, hydrogen, solar, geothermal and wind.

<http://www.usda.gov/wps/portal/usdahome?contentidonly=true&contentid=2008/08/0219.xml>

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*15. DOE Laboratories to Receive Up to \$7 Million to Speed Technology Commercialization*

DOE announced the availability of up to \$7 million to be allocated to seven National Laboratories to help the labs accelerate commercialization of clean energy technologies. With the funding, DOE aims to provide pre-venture capital funding for prototype development, demonstration projects and market research. <http://www.energy.gov/news/6493.htm>

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*16. \$5.5 Million Awarded to Support Hydrogen from Coal and Coal-Biomass*

DOE awarded more than \$5.5 million to six projects that focus on hydrogen generation from coal or coal-biomass mixtures. Projects will be managed by the National Energy Technology Laboratory under the purview of the DOE Office of Fossil Energy's Hydrogen and Clean Fuels Program. [http://www.fossil.energy.gov/news/techlines/2008/08036-DOE\\_Announces\\_Coal\\_Biomass\\_Awards.html](http://www.fossil.energy.gov/news/techlines/2008/08036-DOE_Announces_Coal_Biomass_Awards.html)

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*17. DOE Awards \$2.4 Million Contract to NanoDynamics for 400-Watt SOFC*

DOE has awarded a \$2.4 million contract to NanoDynamics for development of a 400-Watt tubular SOFC to be designed for operation on a variety of fuels including hydrogen and methane gas. The 15-month contract continues funding of a project begun in 2006 under the DOE Biomass Program. <http://www.ndenergy.com/viewer.php?page=press&item=0>

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*18. Army Research Office Awards \$400,000 for SOFC Development*

The U.S. Army Research Office (ARO) has awarded \$400,000 to Protonex Technology Corporation for further development of the company's SOFC systems. Under this contract, Protonex will adapt its propane-fueled SOFC systems to operate on liquid fuels such as butanol, gasoline, kerosene and desulfurized JP-8. <http://www.protonex.com/news/press-releases.aspx>

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Legislative/Regulatory News
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*19. Massachusetts Bills to Spur Clean Energy Technologies, Jobs*

Two bills recently signed into law by Massachusetts Governor Deval Patrick, the Global Warming Solutions Act and the Green Jobs Act, aim to grow the state's economy while protecting the environment by boosting support of the clean energy industry in the state. The Green Jobs Act directs the state to invest \$68 million over the next five years to promote the clean energy industry through establishment of a new clean energy technology center, funding research and workforce training, and fostering collaboration between the state's public and private research institutions. The Global Warming Solutions Act sets an aggressive goal of an 80 percent reduction of the state's toxic emissions by 2050.

[http://www.mass.gov/?pageID=gov3modulechunk&L=1&L0=Home&sid=Agov3&b=terminalcontent&f=features\\_2008-08-14\\_green&csid=Agov3](http://www.mass.gov/?pageID=gov3modulechunk&L=1&L0=Home&sid=Agov3&b=terminalcontent&f=features_2008-08-14_green&csid=Agov3)

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*20. California Adopts Ambitious Long Term Energy Efficiency Strategic Plan*

The California Public Utilities Commission (CPUC) adopted an ambitious Long Term Energy Efficiency Strategic Plan that calls for all new residential construction in the state to be zero net energy by 2020. The plan also calls for all new commercial construction in California to be zero net energy by 2030. CPUC is also promoting the incorporation of energy efficiency into the standard for operating in California for utilities, businesses and consumers.

[http://docs.cpuc.ca.gov/PUBLISHED/NEWS\\_RELEASE/91027.htm](http://docs.cpuc.ca.gov/PUBLISHED/NEWS_RELEASE/91027.htm)

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Industry News
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Medis Technologies announced that its 24/7 Xtreme Charger fuel cell system for iPhones and BlackBerry products will be available in time for the 2008 holiday retail season. The Medis 24/7 Fuel Cell Power Pack was named as a Top Emerging Product by RetailVision, which highlights innovative technology products “created for the retail channel.”

## University Activities

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

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&r=1&f=G&l=50&s1=7.405.020.PN.&OS=PN/7.405.020&RS=PN/7.405.020

<http://www.theautochannel.com/news/2008/08/24/097457.html>

<http://researchnews.osu.edu/archive/biohydro.htm>

<http://chem-eng.utoronto.ca/~mahadevan/>



[http://www.viaspace.com/press\\_article.php?id=1219](http://www.viaspace.com/press_article.php?id=1219)

<http://patft.uspto.gov/netacgi/nph->

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<http://www.sunderland.ac.uk/newsevents/news/news/index.php?nid=457>

Figure 1 consists of two horizontal number lines. The left number line is labeled 'Number of trials' and has tick marks from 0 to 100. A shaded region is marked from 0 to 10. The right number line is labeled 'Number of correct responses' and has tick marks from 0 to 100. A shaded region is marked from 0 to 10.

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<http://wsunews.wsu.edu/pages/publications.asp?Action=Detail&PublicationID=12817&TypeID=1>

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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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**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>)