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**FUEL CELL CONNECTION – February 2005 Issue**  
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IN THIS ISSUE

- * EPA Verifies Operation of Fuel Cell Using Renewable Biogas
- * NETL and Carnegie Mellon Univ. Develop Tool to Reduce Hydrogen Cost
- * Army Seeks DMFC for Tactical Environments
- * PA Funds Fuel Cell, Hydrogen Demonstrations
- * NTT Unveils Prototype Micro Fuel Cell for Mobile Phone

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**CONTENTS**

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

1. *EPA Verifies Operation of Fuel Cell Using Renewable Biogas*
2. *NETL and Carnegie Mellon Univ. Develop Tool to Reduce Hydrogen Cost*
3. *DOE-Funded Researchers Develop Low-Voltage Booster for SOFCs*
4. *Prototype Fuel Cell APU Demonstrated for Military Vehicle*
5. *EPA Launches Clean Energy-Environment Partnership with States*
6. *DOE Welcomes New Secretary of Energy, Samuel Bodman*
7. *Conference Proceedings from SECA Core Technology Peer Review Workshop Posted*

**RFP / Solicitation News**

8. *Army Seeks DMFC for Tactical Environments*
9. *California Clean Cities Opportunities Available through State Energy Program Solicitation*

**Contract / Funding Awards**

10. *PA Funds Fuel Cell, Hydrogen Demonstrations*
11. *Fuel Cell, Hydrogen Research Grants Awarded to Stanford Faculty, Collaborators*

**State Activities**

12. *Florida Governor Announces Hydrogen Energy Technologies Act*

**Industry Headlines**

13. *NTT Unveils Prototype Micro Fuel Cell for Mobile Phone*
14. *Three Hydrogen Fueling Stations Announced*
15. *Honda Fuel Cell Cars Put Into Service*

**University Activities**

16. *Microfabrication at University of Michigan Could Lead to Fuel Cell Cost Breakthrough*
17. *BCIT Offers Part-Time Hydrogen and Fuel Cell Courses*
18. *University Fuel Cell Roundup*

**Administration**

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News on U.S. Government Fuel Cell Programs
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*1. EPA Verifies Operation of Fuel Cell Using Renewable Biogas*

EPA's Greenhouse Gas Technology Center has completed verification of a UTC Fuel Cells PC25C fuel cell power plant, operating on renewable biogas, which achieved efficiencies "higher than other distributed generation technologies" the Center has tested. The Center's deputy director, Tim Hansen, said that "Power generation with the PC25C can greatly reduce nitrogen oxides and carbon dioxide emissions, and can provide additional environmental and operational benefits through the use of recovered heat," with potential combined heat and power efficiency of approximately 90 percent.

[http://www.sri-rtp.com/Current\\_Events/Press%20Releases/UTC\\_PR.pdf](http://www.sri-rtp.com/Current_Events/Press%20Releases/UTC_PR.pdf)

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*2. NETL and Carnegie Mellon Univ. Develop Tool to Reduce Hydrogen Cost*

The National Energy Technology Laboratory and Carnegie Mellon University have teamed up to develop a new computational modeling tool that could make the production of hydrogen cheaper. The tool enables the prescreening of hydrogen separation membranes, saving researchers both time and money.

<http://www.netl.doe.gov/publications/release/cmu.html>

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*3. DOE-Funded Researchers Develop Low-Voltage Booster for SOFCs*

Researchers at Virginia Polytechnic Institute and State University, working under a DOE research grant managed by the National Energy Technology Laboratory, have developed a converter that can boost low DC (direct current) voltage produced by SOFC stacks to the higher voltage required for conversion to AC (alternating current), which can be used in household and commercial applications.

[http://www.netl.doe.gov/publications/press/2005/tl\\_vatech\\_seca.html](http://www.netl.doe.gov/publications/press/2005/tl_vatech_seca.html)

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*4. Prototype Fuel Cell APU Demonstrated for Military Vehicle*

Battelle and United Defense Industries teamed to develop and demonstrate a prototype fuel cell auxiliary power unit (APU) for use on a Bradley Fighting Vehicle. The project is receiving funding support from the U.S. Army's Tank Automotive Research, Development and Engineering Center (TARDEC) and its National Automotive Center.

[http://www.udlp.com/pr/pr\\_20050216.htm](http://www.udlp.com/pr/pr_20050216.htm)

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*5. EPA Launches Clean Energy-Environment Partnership with States*

The Environmental Protection Agency has launched the new Clean Energy-Environment State Partnership Program, which will assist states as they develop and implement action plans to improve air quality, decrease energy use, reduce greenhouse gas emissions and enhance economic development.

<http://www.epa.gov/cleanenergy/stateandlocal/partners.htm>

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*6. DOE Welcomes New Secretary of Energy, Samuel Bodman*

Dr. Samuel Bodman was sworn in as the 11<sup>th</sup> Secretary of the U.S. Department of Energy. Bodman served as both Deputy Secretary of Commerce and Deputy Secretary of the Treasury.

[http://www.energy.gov/engine/content.do?PUBLIC\\_ID=17340&BT\\_CODE=PR\\_PRESSRELEASE\\_S&TT\\_CODE=PRESSRELEASE](http://www.energy.gov/engine/content.do?PUBLIC_ID=17340&BT_CODE=PR_PRESSRELEASE_S&TT_CODE=PRESSRELEASE)

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*7. Conference Proceedings from SECA Core Technology Peer Review Workshop Posted*  
Conference Proceedings have been posted online from the Solid-State Energy Conversion Alliance's Core Technology Peer Review Workshop, held January 27-28, 2005.  
[http://www.netl.doe.gov/publications/proceedings/05/SECA\\_PeerReview/SECAPeerReview05.html](http://www.netl.doe.gov/publications/proceedings/05/SECA_PeerReview/SECAPeerReview05.html)

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RFP/Solicitation News
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*8. Army Seeks DMFC for Tactical Environments*  
The US Army Operational Test Command is seeking sources for a Direct Methanol Fuel Cell or alternative with 24 VDC, 200-300 W, 100 hours of continuous operation to power test instrumentation in a tactical environment. A pre-solicitation conference will be held 15-17 March 2005 in Killeen, Texas. Contact Patricia Cuff (patricia.cuff@otc.army.mil, 254-288-0883) or Rachele Moore (rachele.moore@otc.army.mil, 254-288-9578) for more information, or the following web site.  
<http://www2.eps.gov/spg/USA/TECOM/DATM01/W9115U%2D0001%2DDMFC/SynopsisR.html>

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*9. California Clean Cities Opportunities Available through State Energy Program Solicitation*  
The California Energy Commission is accepting proposals for Clean Cities category projects through the DOE State Energy Program Special Projects solicitation. Sub-opportunities in the category include projects for refueling infrastructure, school buses, and idle reduction technologies. Hydrogen is one of the authorized alternative fuels eligible under the solicitation. Deadline for proposals is March 28, 2005.  
<http://www.energy.ca.gov/contracts/index.html#sep>

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Contract / Funding Awards
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*10. PA Funds Fuel Cell, Hydrogen Demonstrations*  
Pennsylvania has awarded funding to fuel cell and hydrogen demonstration projects in the state through the Alternative Fuel Incentive Grants Program. The Pennsylvania Transportation Institute received \$302,500 to fund the demonstration of hydrogen and CNG blends in Centre Area Transit buses and Penn State University vans. Kronosport, Inc. received \$41,000 to design and build a small, low speed, hydrogen fuel cell powered utility vehicle for off-road use.  
[http://www.depesf.state.pa.us/news/cwp/view.asp?A=1278&QUESTION\\_ID=453183](http://www.depesf.state.pa.us/news/cwp/view.asp?A=1278&QUESTION_ID=453183)

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*11. Fuel Cell, Hydrogen Research Grants Awarded to Stanford Faculty, Collaborators*  
Seven new research grants, totaling approximately \$9 million, were awarded to Stanford faculty and collaborating researchers at several U.S. and international institutions. The funding will be used to support fundamental research in fuel cells, energy production through biological processes, and other technologies aimed at greatly reducing greenhouse gas emissions. The grants are the first awards by Stanford's Global Climate and Energy Project to external recipients.  
<http://news-service.stanford.edu/news/2005/february16/gcepgrants-021605.html>

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State Activities

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### 12. Florida Governor Announces Hydrogen Energy Technologies Act

At the groundbreaking of Florida's first hydrogen energy station, Governor Jeb Bush outlined a proposal for the Hydrogen Energy Technologies Act, to spur investment and accelerate the commercialization of the technology in Florida. The state's new budget proposal includes \$15 million in earmarks to encourage investment: \$12.9 million for testing and demonstration, and \$2.1 million in new tax incentives.

[http://www.dep.state.fl.us/energy/fla\\_energy/news/021805.htm](http://www.dep.state.fl.us/energy/fla_energy/news/021805.htm)

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Industry Headlines

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### 13. NTT Unveils Prototype Micro Fuel Cell for Mobile Phone

Nippon Telegraph and Telephone Corporation (NTT) has developed a prototype micro polymer-electrolyte fuel cell (PEFC) that uses hydrogen gas and is small enough to directly fit in a mobile phone. NTT successfully demonstrated the prototype powering start-up and signal reception/transmission with a production-model mobile phone.

<http://www.ntt.co.jp/news/news05e/0502/050222.html>

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### 14. Three Hydrogen Fueling Stations Announced

Three hydrogen fueling stations have made news in the past month. ChevronTexaco is demonstrating a hydrogen fueling station in Chino, California, and has broken ground on Florida's first hydrogen fueling station in Orlando. Mazda Motor Corporation recently put a hydrogen fueling station into service near the company's global headquarters in Hiroshima.

[http://www.chevrontexaco.com/news/press/2005/2005-02-18\\_1.asp](http://www.chevrontexaco.com/news/press/2005/2005-02-18_1.asp)

[http://www.dep.state.fl.us/energy/fla\\_energy/news/021805\\_02.htm](http://www.dep.state.fl.us/energy/fla_energy/news/021805_02.htm)

[http://media.ford.com/print\\_doc.cfm?article\\_id=20315](http://media.ford.com/print_doc.cfm?article_id=20315)

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### 15. Honda Fuel Cell Cars Put Into Service

Honda announced it has leased two FCX fuel cell vehicles to the city of Las Vegas and one FCX to the Hokkaido Prefectural Government.

<http://world.honda.com/news/2005/4050127.html>

<http://world.honda.com/news/2005/4050203.html>

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University Activities

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### 16. Microfabrication at University of Michigan Could Lead to Fuel Cell Cost Breakthrough

Research on microfabrication at the University of Michigan could lead to fuel cell cost reductions. The research group hopes to reduce the cost of PEM fuel cells to less than \$1,000 per kW, to be competitive with lithium ion batteries.

<http://www.renewableenergyaccess.com/rea/news/story?id=21843>

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### 17. BCIT Offers Part-Time Hydrogen and Fuel Cell Courses

The British Columbia Institute of Technology's Centre for Energy Systems Applications is introducing a series of three part-time studies evening courses on fuel cells and hydrogen technologies. The courses will start in April 2005.

<http://www.bcit.ca/study/courses/list.php?s%5B%5D=CESA&l=0&t=0&n=&ct=>

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*18. 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))

A research team with Stanford University's Global Climate and Energy Project is investigating the use of genetically engineered photosynthetic bacteria to generate hydrogen. James Swartz, professor of chemical engineering, and Alfred Spormann, associate professor of civil and environmental engineering, are leading researchers to investigate solar-powered bacterial processes that create hydrogen. (8-Feb-2005, *University Wire*)

Michigan universities could benefit from Gov. Jennifer Granholm's desire to sell \$2 billion in state bonds over 10 years to invest in high-tech industries that she said are the economic salvation for an automotive-reliant state with one of the nation's worst unemployment rates. Granholm, in her State of the State address, said the capital infusion to private industry and universities would generate 72,000 new jobs and is the centerpiece of a plan to diversify the state's economy, while maintaining its historic connection to the auto industry. The bond money would be aimed largely at research for the auto industry – particularly the development of fuel-cell power – as well as health-related technology and products used for homeland security to prevent terrorist acts and other threats to the nation, Granholm said. Voters would have to approve the bond proposal, and Granholm wants it on the November ballot. For that to happen, two-thirds of the members of both the state House and Senate would have to approve putting it before voters. (9-Feb-2005, *Detroit Free Press*)

VOLLER Energy, which plans to manufacture fuel cell generators and battery chargers in Sheffield, England, has acquired KAT-Chem, a spinoff from Bremen University in northern Germany that developed reformer technology to extract hydrogen from propane, butane, liquid petroleum gas and the like for fuel cells. As part of the deal, Voller will gain a laboratory in Bremen, two staff and two patent applications. Voller has also announced the appointment of Mark Turpin as its chief technology officer. Turpin received his doctorate in materials science and engineering from Sheffield University and has 20 United Kingdom patents to his name, along with 20 fuel cell-related UK patents either granted or pending. Turpin has been a consultant to a number of technology industries and was also a senior scientist at Duracell batteries. (11-Feb-2005, *The [Sheffield] Star*)

University of Georgia engineers recently began developing a pilot-scale biorefinery that will process a variety of biomass – from wood chips to chicken litter – to generate fuel for vehicles and factories. UGA leads a consortium (universities, federal labs and industry) that operates the pilot facility in Athens. The biorefinery currently produces a char, which is similar to charcoal, and hydrogen, which will be used to demonstrate a new fuel cell being developed by the UGA chemistry and physics departments. There are plans to produce biodiesel and ethanol fuels and bio-oils in the future. The new technology is seen as having the potential to rejuvenate a steadily shrinking forest industry and provide markets for agricultural byproducts. (15-Feb-2005, *The Atlanta Journal-Constitution*)

Farmingdale State University of New York has received two grants totaling \$85,000, the largest of which would finance the creation of a Fuel Cell Learning Center, officials have announced. The fuel cell center includes plans to create a model home powered by hydrogen fuel cells to help educate the public about what officials call an inexpensive and environmentally friendly source of power. (18-Feb-2005, *Newsday*)

Infotech, Inc. will undertake a feasibility study with the Department of Environmental Science and Engineering of Gannon University in Erie, Penn., to develop a bioreactor that utilizes Infotech's patented bacterial culturing methods to produce hydrogen inexpensively. Infotech believes the most likely method for low-cost production of massive quantities of hydrogen as an alternate energy source is hydrogen combustion using Clostridia bacteria, which produces hydrogen as a by-product. Infotech has ascertained through its patent counsel that there are 11 relevant U.S. patents concerning the database containing the terms "Clostridia" and "Hydrogen Production." Infotech claims ownership of five of the 11 issued patents. (19-Jan-2005, *PR Newswire*)

Researchers at the New York College of Ceramics at Alfred University are studying ways to store hydrogen without having to super-chill it, one of its big drawbacks. Ceramics research, addressed by Alfred's, is a key to hydrogen storage as well as fuel cell technology. (23-Jan-2005, *Buffalo News*)

Among those recently named to the National Academy of Engineering's 2005 scroll of honor is Subhash Singhal, director of fuel cells at Pacific Northwest National Laboratory in Richland, Washington. Previous years' honorees include Stephen Hawking and Bill Gates, Lee Iacocca and Lou Gershner. (17-Feb-2005, *The Times of India*)

HTC Hydrogen Technologies Corp. (formerly Westrange Corp.) of Canada recently announced a name change and various research and development accomplishments in 2004, including signing memorandums of understanding with the University of Regina on CO<sub>2</sub> capture and the establishment of an HTC Industrial Research Chair, and finalizing plans for the construction of a full-scale "demonstration plant" at the Greenhouse Technology Centre at the University of Regina that will be used as a commercialization staging platform. HTC also is in negotiations with the University of Melbourne and the Australian Government's CRC CO<sub>2</sub> Research Centre to establish a joint research project in Australia in membrane technology development for hydrogen production and CO<sub>2</sub> capture. (24-Jan-2005, *Canadian Corporate Newswire*)

University of Iowa graduate student Luke Haverhals has designed a remotely-controlled, fuel-cell powered car. The 27-year-old, one of the first on the IU campus to make a car powered by hydrogen fuel cells, is on a team with 13 other researchers. The group's goal is to advance the technology, which releases fewer toxins into the atmosphere and uses less fuel than conventional engines. Haverhals claims that his car works differently from other designs of its type but has declined to comment on the specifics because of patent concerns. (24-Jan-2005, *University Wire*)

Researchers from Pennsylvania State University have constructed a material made from titanium dioxide nanotubes that is 97 percent efficient at harvesting the ultraviolet portion of the sun's light and 6.8 percent efficient at extracting hydrogen from water. The material is easy to make, inexpensive, and photochemically stable, according to the researchers. The 97 percent efficiency is the highest reported, according to the researchers. There is one catch – only 5 percent of the sun's energy is ultraviolet light. The researchers are working to find a way to shift the response of the nanotube arrays into the visible spectrum. The work appeared in the January 12, 2005 issue of *Nano Letters*. (27-Jan-2005, *Technology Research News*)

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Press releases and story ideas may be forwarded to Bernadette Geyer, editor, for consideration at [bernie@usfcc.com](mailto: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.

[\(http://www.usfcc.com/\)](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.

[\(http://www.nfcrc.uci.edu/\)](http://www.nfcrc.uci.edu/)

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<http://www.netl.doe.gov>