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**FUEL CELL CONNECTION -- June 2005 Issue**  
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News on U.S. Government Fuel Cell Programs

1. DOE to Establish National Center for Hydrogen Technology

The U.S. Department of Energy announced it has awarded \$2.7 million to the University of North Dakota to establish a National Center for Hydrogen Technology, which will focus on obtaining hydrogen from coal. The award is a one-year cooperative agreement with the University, which will also test a range of technologies from hydrogen production to transportation to utilization.

http://www.fossil.energy.gov/news/techlines/2005/tl_undeerc_hydrogen.html

2. ANL Research Team Develops New Hydrogen Sensor

A team of researchers in the Materials Science Division at Argonne National Laboratory demonstrated an enhanced hydrogen sensor design that shows a rapid and reversible response to hydrogen gas that is repeatable over hundreds of cycles. The sensor material is made by depositing a discontinuous palladium thin film on a glass slide coated with a grease-like self-assembled monolayer of siloxane attached to the surface.

http://www.anl.gov/Media_Center/News/2005/news050525.html

3. Sandia Details Hydrogen Storage Efforts

Sandia National Laboratories and General Motors have launched a 4-year, \$10 million partnership to design and test metal hydrides for hydrogen storage on-board vehicles. Researchers will also perform rigorous safety testing of tank designs.

<http://www.sandia.gov/news-center/publications/sandia-technology/2005/st2005v7no1.pdf>

4. DOE Announces Winner of H2U Student Design Competition

A team of students from Humboldt University is the Grand Prize Winner of the 2005 H2U Student Design Competition for its design proposals for a Hydrogen Power Park in Eureka, California. Honorable mentions were awarded to teams from the University of Toronto, University of Waterloo, Cornell University and University of Washington.

<http://www.h2ucontest.org/05contest.html>

5. Science Bowl Hydrogen Fuel Cell Car Competition Winners Announced

Smith Middle School, from Chapel Hill, North Carolina, won first place in the model hydrogen fuel cell competition on the first day of the 2005 National Middle School Science Bowl. St. Andrew's Episcopal School, from Amarillo, Texas, received second place, and Robert Frost Middle School, from Rockville, Maryland, came in third.

<http://www.scied.science.doe.gov/nmsb/default.htm>

RFP/Solicitation News

6. DOE Issues Master Announcement for Co-Production Advanced Technology

The Department of Energy, Office of Coal and Power R&D at the National Energy Technology Laboratory is seeking cost-shared applications for R&D efforts to improve coal-based technologies directed at co-producing hydrogen and electricity, and other technologies. An estimated \$6 million is available for up to two Phase I & II projects, and up to \$6 million for one Phase III project. Deadline for proposals is July 15, 2005.

<http://www.fedgrants.gov/Applicants/DOE/PAM/HQ/DE-PS26-05NT42512-0/Grant.html>

7. Air Force Seeks SOFCs for Military Applications

The Department of the Air Force has issued a grants notice for Power Dense Solid Oxide Fuel Cell Power Units for Military Applications. The objective of the effort is to develop a 1.5-kW nominal SOFC power unit capable of continued operation on desulfurized JP8 fuel. Estimated total program funding is \$2.6 million. Proposals are due July 21, 2005.

<http://www.fedgrants.gov/Applicants/USAF/AFRL/Wright/BAA-03-05-PRK-Amendment-05/Grant.html>

8. High-Temperature SOFC Solicitation by DOE HFCIT Program – Alaska Focus

The Department of Energy's Hydrogen, Fuel Cell & Infrastructure Technologies Program has issued a solicitation on High Temperature Solid Oxide Technologies Research. DOE is seeking applications that will advance high temperature SOFCs for the co-production of electricity and hydrogen. Approximately \$4.5 million is available for awards under this solicitation. For Topics 1 & 2 (R&D and Demonstration), either the prime applicant or a partner must be an organization located in Alaska. For Topic 2, the demonstration site must be located in Alaska. Deadline for applications is July 25, 2005. <http://www.fedgrants.gov/Applicants/DOE/PAM/HQ/DE-PS36-05GO95019/listing.html>

9. DOE Invites Applications for Polymer Membrane Projects

DOE's Golden Field Office is inviting applicants to develop high temperature, low relative humidity polymer electrolyte-type membrane materials suitable for use in a PEM fuel cell. The objective of the solicitation is to develop materials with performance at 120 degrees C and 25-50 percent relative humidity. A total of \$2.5 million is available. Deadline for applications is August 4, 2005.

<http://www.fedgrants.gov/Applicants/DOE/PAM/HQ/DE-PS36-05GO95020/Grant.html>

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**Contract / Funding Awards**  
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10. DOE Awards Grants for University Energy Research

The Department of Energy has awarded grants to eight institutions for energy research through the Historically Black Colleges and Universities and Other Minority Institutions program. North Carolina A&T State University received funding for a project to develop a composite membrane based on palladium and palladium-silver alloy for hydrogen separation.

http://www.fossil.energy.gov/news/techlines/2005/tl_hbcu_awards.html

11. PA Energy Development Authority Awards \$10 Million for Clean Energy Projects

The Pennsylvania Energy Development Authority (PEDA) awarded \$10 million to 17 clean energy projects in the state, including one fuel cell project. Franklin Fuel Cells will receive \$460,000 to research ongoing development of SOFC technology.

<http://www.depesf.state.pa.us/news/cwp/view.asp?Q=464467/&A=3&Q=458405>

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**State Activities**  
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12. MA Hydrogen Coalition Unveils Initiatives

The Massachusetts Hydrogen Coalition has unveiled seven proposed initiatives to significantly expand the hydrogen and fuel cell industry in the state. Initiatives include developing the state's Clean Energy Corridor, establishing a hydrogen and fuel cell center, increased state resource allocation and procurement, and establishment of appropriate tax and financial incentives.
http://www.fuelcell-magazine.com/fc_newsletter_6-05.htm#massachusetts

13. Texas Creates \$200 Million Emerging Technology Fund

Texas Gov. Rick Perry has signed a bill creating a \$200 million Emerging Technologies Fund, which aims to foster emerging technologies, enhance university-industry collaboration, and promote technology commercialization.

<http://www.governor.state.tx.us/divisions/press/pressreleases/PressRelease.2005-06-13.4031>

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**Industry Headlines**  
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14. Fuel Cell Keeps Power Going During Russian Blackout

A PureCell™ 200 fuel cell system from UTC Power kept the electricity going for one of the facilities of Russia's oil and gas pipeline engineering company, Orgenergogaz, during the country's May 25, 2005, blackout.

<http://www.utcfuelcells.com/utcpower/news/archive/2005-05-31.shtm>

15. Honda, Toyota Talk Fuel Cell Car Costs

Toyota recently announced it aims to cut the cost of fuel cell cars to \$50,000 by 2015. Honda also announced its aims to cut fuel cell car costs to a hundredth of the present level to make them competitive with conventional vehicles. According to a Reuters' report, the chief engineer of Honda's research and development operation said "fuel cell cars could have a market share of 5 percent by 2020."

<http://go.reuters.com/newsArticle.jhtml?type=topNews&storyID=8890514>

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**University Activities**  
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16. 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)

HERA, Hydrogen Storage Systems Inc., announced that it has become exclusive licensee of a substantial portfolio of intellectual property developed by McGill University in Montreal, Canada. The portfolio covers advanced hydride materials and technologies for hydrogen storage. The inventions are protected by a total of 20 patents issued, and close to another 30 patents filed in North America, Europe and Asia. [3-May-2005, *Canada News Wire*]

A fuel cell that "runs on blood without using toxic substances" has been developed by a team led by Matsuhiko Nishizawa, bio-engineering professor at the graduate school of state-run Tohoku University in Japan. "Since the electron mediator is based on Vitamin K3, which exists in human bodies, it excels in safety and could in the future generate power from blood as an implant-type fuel cell," according to Agence France-Presse (AFP). The newly developed cell in the size of a

tiny coin is able to generate 0.2 milliwatts of electricity, enough to power a device that measures blood sugar level and transmit data elsewhere, adds AFP. [13-May-2005, Agence France-Presse]

Fuel Cell Technologies Limited has shipped a 5-kW SOFC combined heat-and-power system to the University of Liege in Belgium. The demonstration is the first of several installations planned for Europe this year. The 5-kW system, which uses tubular solid oxide technology, will be compared to conventional methods of power and heat generation at the University of Liege's Montefiore Institute. [1-June-2005, *Canada News Wire*]

A group of more than a dozen high school students has formed the Fuel Cell Awareness Coalition after a field trip to the Global Fuel Cell Center at the University of Connecticut in May. The students attend Foran High School in Milford, CT. "One of our main goals is to raise awareness about fuel cell technology and its benefits," said freshman Dan Dademo, 14. "If the technology became more available, we could decrease global warming and our dependence on oil." [7-June-2005, (*Bridgeport*) *Connecticut Post*]

On June 7, Rensselaer Polytechnic Institute opened a new \$20 million center for future energy systems in partnership with Cornell University and Brookhaven National Laboratory. The new facility, called the Center for Future Energy Systems, a New York State Center for Advanced Technology, seeks to meet the energy challenges of the 21st century by focusing on innovation in and commercialization of energy conservation and renewable energy systems. There will be an initial emphasis on fuel cells and the hydrogen economy, smart lighting, smart displays, and emerging renewable energy systems. Future research priorities will track new scientific developments and marketplace opportunities. [7-June-2005, *M2 Presswire*]

A group of scientists from University of Southern California (USC), California Institute of Technology and Northwestern University say they have discovered a way to make fuel cells generate the heat they need to function, which could lead to new designs of lighter and more powerful batteries for portable electronic devices. The new technology would eliminate the need for a separate heat source to serve as a catalyst for the chemical process that generates electricity, according to a study published this month in the journal *Nature*. That would allow for miniaturized cells that would be used in both commercial and military applications, said Paul Ronney, a professor of aerospace and mechanical engineering at USC. The researchers estimated that it would be five to 10 years before the technology would be available for commercial use. [9-June-2005, *The Los Angeles Times*]

A team of more than 100 students from Canada's University of Waterloo has defeated teams from 16 American universities with a design for the "green car" of the future. The Canadian team won the first year of the Challenge X Competition, which is co-sponsored by the U.S. Department of Energy and General Motors Corporation, with the design of a fuel cell powered sport utility vehicle. The team, made up mostly of engineering students, was the only one from a Canadian university to enter the three-year contest in Detroit. The competition involved re-engineering a Chevrolet Equinox with the goal of improving fuel economy and reducing emissions, while maintaining performance and safety. The team, sponsored by Natural Resources Canada and Hydrogenics Corporation, was the only one to use fuel cells for vehicle propulsion in its design. [10-June-2005, *Canadian Press NewsWire* and *Canada News Wire*, and June 2005 *Motor Trend*]

A team of researchers from Washington and St. Louis universities has developed experimental technology pointing to the viability of powering fuel cells using intestinal bacteria feeding on wastewater. The researchers feed their bacteria a solution of sugar water, but, according to the researchers, large-scale reactors would run on wastewater from food processing plants. Sewage also could be used, but it has a lower concentration of organic matter and probably could produce only enough electricity to make a sewage treatment plant self-sufficient. Self-powering sewage treatment plants could make more than 1 percent of the nation's electricity production available to heat homes and businesses and keep lights burning, predicts Largus T. Angenent, an

environmental engineer at Washington University. [16-June-2005, *St. Louis (Missouri) Post-Dispatch*]

The University of South Carolina and the Korea Institute of Energy Research announced they will collaborate on fuel cell research. The collaboration involves University of South Carolina's Center for Fuel Cell Research. The agreement allows for a scientist exchange program between the two institutions, and also establishes guidelines for any patents and intellectual property rights developed through the institutions' research efforts. [17-June-2005, Univ. of South Carolina Center for Fuel Cell Research]

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**Administration**  
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Press releases and story ideas may be forwarded to Bernadette Geyer, editor, for consideration at bernie@usfcc.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.

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

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>