PDF Versions of Fuel Cell Connection are posted at http://www.usfcc.com/resources/backissues.html

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FUEL CELL CONNECTION – July 2006 Issue

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News on U.S. Government Fuel Cell Programs
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1. Fuel Cells Power Space Shuttle Discovery
Fuel cells built by UTC Power provided all the electrical power for the Space Shuttle Discovery's 12-day mission to the International Space Station. Each of the three alkaline fuel cells on the shuttle produces up to 12 kW and is more than 70 percent efficient.
http://www.utcpower.com/fs/com/bin/fs_com_Page/0,9235,04525,00.html

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2. NETL Hydrogen Separation Membrane Project Exceeds Targets
A hydrogen separation membrane project by Eltron Research, in partnership with the National Energy Technology Laboratory, has exceeded targets for producing pure hydrogen from coal-derived synthesis gas. The membrane met DOE 2015 targets for sulfur tolerance, economic life, and operating conditions and exceeded targets for hydrogen production rate, product purity and cost. http://www.ornl.gov/info/news/pulse/pulse_v213_06.htm

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3. IEC Opens Door to Portable Fuel Cells on Passenger Aircraft
Portable fuel cell powered devices are another step closer to use on passenger aircraft thanks to a new safety specification published by the International Electrotechnical Commission (IEC). "IEC/PAS 62282-6-1 (2006-02) Fuel cell technologies – Part 6-1: Micro fuel cell power systems – Safety" includes testing and design requirements to ensure safety during use and transportation. It covers fuel cells in devices such as cell phones, audio devices, and laptop computers. Compliance with the specification is required, starting in 2007, for devices that would be transported on passenger aircraft.
http://www.usfcc.com/resources/Mar6-EM.IECPAS%2062282-6-1-Press%20Release-06-002.pdf
http://webstore.iec.ch/webstore/webstore.nsf/artnum/035728

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4. FutureGen Alliance Announces Finalist Candidate Host Sites
The FutureGen Alliance announced four finalist candidate sites for hosting a $1 billion near-zero emissions coal-fueled power plant: Mattoon, IL; Tuscola, IL; Heart of Brazos (Jewett), TX; and Odessa, TX. The power plant will produce both electricity and hydrogen while sequestering carbon dioxide. The Alliance plans to select a final site in the latter half of 2007.
http://www.fossil.energy.gov/news/techlines/2006/06044-FutureGen_Candidate_Sites_Narrowed.html

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RFP/Solicitation News
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5. NYSERDA to Fund Environmentally Preferred Power, Energy Storage Projects
The New York State Energy Research and Development Authority (NYSERDA) is seeking proposals for development and demonstration of innovative renewable and other environmentally

preferred Distributed Generation (DG) power systems and/or related components. Individual project awards range from $50,000 to $1 million per project. Approximately $8.5 million is expected to be available for this solicitation. Deadline for proposals is August 22, 2006. See PON 1042 at the following web site. http://www.nyserda.org/Funding/funding.asp?i=2

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6. LLNL Offers Joint Fuel Cell Membrane, MEA Research Opportunity
Lawrence Livermore National Laboratory is offering the opportunity to jointly research, develop and commercialize a novel composite membrane electrolyte and membrane electrode assembly technology for fuel cells. An industrial partner is sought to collaborate with the lab and a team of Russian scientists. Companies must submit a written statement of interest by August 25, 2006.
http://www.fbo.gov/spg/DOE/LLNL/LL/Reference-Number-fbo137-06/Synopsis.html

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7. ONR Issues BAA for Portable Power Technology
The Office of Naval Research (ONR) has issued a Broad Agency Announcement for Single-Person Portable, JP-8 Fueled Advanced Power Generation Technology Development and Demonstration. ONR anticipates up to four Phase I contract awards of approximately $200-300K each. Deadline for proposals is August 28, 2006.
http://www.fbo.gov/spg/DON/ONR/ONR/ONR-BAA-06-023/listing.html

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8. USDA SBIR Includes Hydrogen from Bio-Fuels as Eligible Projects
The U.S. Department of Agriculture has released its Small Business Innovation Research program request for proposals. Hydrogen from bio-based fuels is one of the sub-topics included in the solicitation. Phase I awards typically range up to $80,000 for a period of up to 8 months. Deadline for proposals is September 1, 2006.
http://www.csrees.usda.gov/funding/rfas/pdfs/07_sbir.pdf

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Contract / Funding Awards
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9. CCEF Funds Fuel Cell Backup Power System Installations
The Connecticut Clean Energy Fund financed the installation of fuel cells at the Town of Wallingford's power substation and for a major telecommunications company. The 15-kW regenerative fuel cell for the Town of Wallingford's Department of Public Utilities can provide up to eight hours of operation in the event of a power failure. The telecom fuel cell installation provides a minimum of 3.5 kW of backup power.
http://home.businesswire.com/portal/site/home/?epi_menuItemID=989a6827590d7dda9cdf6023a0908a0c&epi_menuID=c791260db682611740b28e347a808a0c&epi_baseMenuID=384979e8cc48c441ef0130f5c6908a0c&ndmViewId=news_view&newsLang=en&div=973078938&newsId=20060629005619

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10. TMI and Ricardo Receive Grant for Fuel Cell APU Development
Technology Management Inc. and Ricardo have received a $1 million grant through the Ohio Third Frontier Fuel Cell Program for development of an integrated multi-fuel fuel cell auxiliary power unit as an alternative to idling large diesel engines.
http://www.greencarcongress.com/2006/06/ricardo_and_tec.html

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11. SunLine Transit Awards Hydrogen Fuel Supply Contract to HyRadix

SunLine Transit Agency has awarded to HyRadix the contract to supply a hydrogen fuel generation system for the Agency's hydrogen bus fleet, which will be increasing over the next few years. http://www.hyradix.com/common/documents/06.30.06%20HyRadix%20Release.pdf

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12. Army Phase II SBIR Contract Awarded to Millennium Cell and ReliOn
The U.S. Army Tank-automotive and Armaments Command has awarded a $730,000 Phase II Small Business Innovation Research Program (SBIR) contract to Millennium Cell and its subcontractor, ReliOn, for development of a fully modular 500-watt fuel cell power system that can use available field water with a variety of impurities.
http://www.millenniumcell.com/fw/main/default.asp?DocID=92&reqid=879203

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13. DOD Awards Funding for Hydrogen Generation System
The U.S. Department of Defense awarded $1.36 million to FuelCell Energy to advance its Electrochemical Hydrogen Separator (EHS) project for use with the company's Direct FuelCell power plants. The subscale EHS system currently produces 1200 liters per hour of pure hydrogen. The DOD funding will enable the scaling up of the unit by a factor of 25.
http://www.corporate-ir.net/ireye/ir_site.zhtml?ticker=FCEL&script=410&item_id=879274&layout=23

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14. Air Force Awards Contract to Protonex for UAV Power System
The U.S. Air Force Research Laboratory has awarded a second contract to Protonex for continued development of a fuel cell-based power system for unmanned aerial vehicles. The contract has a total program value of $749,247.
http://www.protonex.com/07-18-06%20UAV%20BOD.pdf

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State Activities
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15. New Hawaii Energy Bills Support Hydrogen, Fuel Cells
Hawaii Governor Linda Lingle signed into law a package of energy bills supporting energy efficiency and renewable energy technologies. SB2957 establishes a Hawaii renewable hydrogen program as well as a hydrogen investment capital special fund. SB3185 removes links between fossil fuel costs and the price paid to renewable power producers. HB2848 appropriates funding for the Hawaii Energy Policy Forum to develop an action plan and other recommendations to meet the state's energy self-sufficiency goals.
http://www.capitol.hawaii.gov/sessioncurrent/bills/SB2957_cd1_.htm
http://www.capitol.hawaii.gov/sessioncurrent/bills/SB3185_cd1_.htm
http://www.capitol.hawaii.gov/sessioncurrent/bills/HB2848_cd1_.htm

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16. PA PUC Adopts Net Metering Rules
Pennsylvania's Public Utility Commission has issued an order adopting net metering rules for customers who generate electricity using a wide variety of distributed generation technologies, including fuel cells. Under the new rules, investor-owned utilities must make net metering available to residential customers with systems up to 50 kW in capacity; nonresidential customers with systems up to one megawatt; and customers with systems greater than one megawatt but no more than two megawatts who make their systems available to the grid during emergencies.
http://www.puc.state.pa.us/PcDocs/614223.doc

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17. Vermont Expands Net Metering Law
Vermont has revised several components of the state's existing net metering law. Among the changes to the law: eligibility has been extended to systems that use a "renewable energy" source; net metering is available on a first-come, first-served basis, with a cap linked to the utility's peak demand; and customers now have 12 months to utilize net excess generation before it is granted to the utility with no compensation to the customer.
http://www.leg.state.vt.us/docs/legdoc.cfm?URL=/docs/2006/acts/ACT208.HTM

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18. PA Small Business Advantage Grants Available for Energy Efficiency, Pollution Prevention
Pennsylvania will provide $1 million in Small Business Advantage Grants for projects to enhance energy efficiency or promote pollution prevention. The program provides a matching grant of up to $7,500 for equipment or processes that reduce energy consumption and promote pollution prevention. http://www.depweb.state.pa.us/news/cwp/view.asp?Q=509099&A=3

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19. Vermont Opens First Hydrogen Fueling Station
Vermont opened the state's first hydrogen fueling station, located near the City of Burlington's waterfront. The project received approximately $1 million from the Department of Energy.
http://www.protonenergy.com/company/hyd-tech/fueling/h2station.html

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Industry Headlines
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20. PolyFuel Membrane Receives ISO 9001 Certification
Underwriters Laboratories has granted PolyFuel the ISO-9001:2000 certification for the design and manufacture of fuel cell membranes. The certification signifies PolyFuel has achieved the standard of quality for product design and manufacturing processes required for mass commercialization.
http://www.polyfuel.com/pressroom/press_pr_071006.html

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21. Modine Unveils Fuel Cell System for Truck Idling
Modine Manufacturing Company unveiled a new fuel cell idle reduction system for truck drivers. The "idle-off" system can be used for both cooling and heating the sleeper cabin in a heavy-duty truck. Twenty-two states have pending legislation that limits truck idling in some form, as a way of reducing pollution from idling trucks.
http://www4.modine.com:7001/portal/portlets/dynamicContentNav/link.do?page=news_room&category=news_room/news_archive&doc_id=press_releases_2006_07_17_rel_1.jsp

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22. Fuel Cell Dedicated at Los Angeles Zoo
A UTC Power 200-kW fuel cell was dedicated at the Los Angeles Zoo, located just south of the Zoo parking lot in a restored native plant garden with walking paths that provide access to the facility. http://www.ladwp.com/ladwp/cms/ladwp008414.jsp

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23. BP and GE to Build Up to 15 Hydrogen Power Plants by 2016
BP and GE announced they will jointly build ten to fifteen hydrogen power plants, which will generate hydrogen from a fossil fuel while sequestering carbon dioxide. The companies expect the projects to be implemented over the next ten years.
http://www.bp.com/genericarticle.do?categoryId=2012968&contentId=7019791

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University Activities
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24. 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)

New York Institute of Technology's 2005 Solar Decathlon team dedicated its solar-powered fuel cell home as "America's First Solar-Hydrogen Home" at a June 19, 2006, ribbon-cutting ceremony at the U.S. Merchant Marine Academy at Kings Point, N.Y. USMMA was NYIT's sole academic partner during the international competition that is sponsored by the U.S. Department of Energy. The ceremony was held in conjunction with USMMA's commencement, where President George W. Bush delivered the keynote address. The solar-hydrogen fuel cell home, now permanently located on the USMMA campus, will serve as a renewable energy research and educational center for the academy's Alternative Power Program. The 800-square-foot house was originally constructed on NYIT's Old Westbury, N.Y., campus, disassembled into seven parts, transported and rebuilt at the National Mall in Washington, D.C., for the 2005 Solar Decathlon. Following the competition, the house was transported back to New York, rebuilt, and donated to the USMMA. NYIT was the only finalist participating from the New York metropolitan area and the only school to use a hydrogen fuel cell for energy storage. NYIT has again been selected by the U.S. Department of Energy to compete in the 2007 Solar Decathlon. [3-July-2006, *Fuel Cell Today*]

Fuel cells were among the technologies showcased by a team of chemists from the University of Bath in early July. The researchers participated in the prestigious Summer Science Exhibition hosted by the Royal Society, the United Kingdom's premier scientific institution. The free exhibition is held annually at the Royal Society's headquarters in Carlton House Terrace, London. The university's exhibit, titled "Power to the People: The Molecular Revolution in Sustainable Energy," included state-of-the-art, computer-generated molecular models used by Professor Saiful Islam and his team to develop fuel cells for transport. [4-July-2006, *Bath Chronicle*]

Baldwin-Wallace College in Berea, Ohio, is part of a business consortium led by NASA Glenn Research Center that hopes to develop and manufacture a cutting-edge electrical storage device that could replace batteries. Cuyahoga County has pledged $750,000 to match dollar-for-dollar a Third Frontier development grant the consortium is hoping to win from the state this fall. The grant's terms call for commercial development in as little as three years. Known as "nanostructured super capacitors," the rechargeable devices could make plug-in hybrid cars and fuel-cell vehicles a reality because they could store much more power than a battery. "We are looking at what we think is breakthrough technology with double the energy storage of others on the market," said Larry Viterna, team leader for NASA Glenn's Strategy and Business Development Center. "And it can be manufactured for less than any of the others now available." NASA Glenn's partners in the project are Eaton Corp., for its expertise in automotive and electrical systems; carbon and graphite electrode manufacturer Graftech International, based in Parma; JME Inc., a Shaker Heights consulting company with expertise in capacitors; and Baldwin-Wallace College, which will develop the business model for a manufacturing company. [5-July-2006, *Plain Dealer* (Cleveland)]

A research team led by Angela D. Lueking, assistant professor of energy and geoenvironmental engineering at Penn State, inadvertently stumbled upon a method that combines hydrogen production and storage, and produces nanocrystalline diamonds as a by-product. Lueking's group had been exploring a way to store hydrogen in carbon-based materials. Lueking and colleagues, who included Humberto R. Gutierrez, postdoctoral fellow in physics; Dania A Fonseca, postdoctoral fellow in the Penn State Energy Institute; Deepa L. Narayanan, Dirk Van Essendelft

and Puja Jain, graduate students in energy and geoenvironmental engineering; and Caroline E. B. Clifford, a research associate at the Energy Institute, ball milled powdered anthracite coal with cyclohexene. The researchers reported their results in a recent online issue of the *Journal of the American Chemical Society*. Lueking and her colleagues currently have a variety of experiments underway including looking at anthracite coal from different mines, looking at different hydrogenating compounds and trying to understand the mechanics of ball milling, the evolution of the hydrogen gas and the formation of the nanocrystalline diamonds and Bucky diamonds. [13-July-2006, *Space Daily*]

Chevron Corporation and the Georgia Institute of Technology have formed a strategic research alliance to pursue advanced technology aimed at making cellulosic biofuels and hydrogen viable transportation fuels. Chevron Technology Ventures, a subsidiary of Chevron Corporation, plans to collaborate with Georgia Tech's Strategic Energy Institute and contribute up to $12 million over five years for research into and development of these emerging energy technologies. Scientists from Chevron and Georgia Tech are working to develop regenerative sorbents that can be used repeatedly, thereby reducing the cost of hydrogen production from natural gas. Sorbents are used in hydrogen production from natural gas to remove odorants that contain sulfur. They are usually costly and can be used only once. In a related project, researchers are working to develop sorbents for the purification of hydrogen produced from natural gas reforming. Both hydrogen performance and vehicle performance increase with sorbent performance, leading to greater overall energy efficiency. [15-July-2006, *PR Newswire US*]

Contained Energy will work with Case Western Reserve University’s Wright Fuel Cell Group to develop a direct carbon fuel cell that uses carbon instead of hydrogen to make electricity. Contained Energy was formed to build a fuel cell based on technology at Lawrence Livermore National Laboratory in California. The company plans to move its research and development operations from California to Ohio this year. It has received $400,000 from the Northeast Ohio nonprofit venture capital organization JumpStart Inc. Wright gets funding from the state's Third Frontier Project. [18-July-2006, *Akron Beacon Journal* (Ohio)]

Millennium Cell Inc., which announced that it has joined the University of South Carolina's National Science Foundation Industry/University Cooperative Research Center for Fuel Cells. This is the nation's only NSF-sponsored fuel cell center and is dedicated to the commercialization of fuel cell technologies. As a member of the center, Millennium Cell will partner with USC faculty and students to advance research in hydrogen storage materials, boron chemistry, and hydrogen battery systems. Other companies that have joined the center are DANA Corporation, General Motors Corporation, Air Liquide, John Deere, ePower Technologies, Westinghouse Savannah River Co., BASF AG, Boeing and LG Electronics. [19-July-2006, *Business Wire*]

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Press releases and story ideas may be forwarded to Bernadette Geyer, editor, for consideration at fuelcellconnection @ comcast.net.

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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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