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FUEL CELL CONNECTION – October 2004 Issue

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News on U.S. Government Fuel Cell Programs
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1. DOE, DTE Energy Open Michigan Hydrogen Technology Park
The U.S. Department of Energy and DTE Energy opened a hydrogen technology park in Southfield, Michigan, that will demonstrate the ability of a "power park" to provide hydrogen produced by solar-powered electrolysis for fuel cell vehicles. For the demonstration, DaimlerChrysler will provide the vehicles, and BP will provide the refueling technology.
http://www.energy.gov/engine/content.do?PUBLIC_ID=16785&BT_CODE=PR_PRESSRELEASES&TT_CODE=PRESSRELEASE

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2. Fuel Cell Supports Air Force Firehouse in Alaska
A fuel cell installed at the firehouse at Elmendorf Air Force Base in Alaska started up in June and is reported to be running "nearly flawlessly" since then. The fuel cell, which was installed as part of the 3rd Civil Engineer Squadron's pollution prevention program, provides 5 kW of power and enough hot water to support the firehouse.
http://www.af.mil/stories/story.asp?storyID=123008987

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3. ANL Powertrain Research Facility Now Hydrogen-Capable
Argonne National Laboratory's Advanced Powertrain Research Facility has received upgrades that will enable it to test hydrogen fuel cell engine technologies as well as technologies for hydrogen internal combustion engines.
http://www.eere.energy.gov/vehiclesandfuels/cfml/news_detail.cfm/news_id=8227

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New Government Publications Posted
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4. SECA Posts Fuel Cell Annual Report, Interconnect Meeting Proceedings
The Solid-State Energy Conversion Alliance has posted online the Fuel Cell Annual Report 2004, and the proceedings from the SOFC Interconnect Meeting, held in July 2004.
http://www.seca.doe.gov/whatsnew.html

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5. ATP Report on Economic Progress Published
The Advanced Technology Program of the Department of Commerce National Institute of Standards and Technology has published its 2004 Report on Economic Progress, which touts several fuel cell projects among its "Investments to Keep America Energized."
http://www.atp.nist.gov/eao/2004annual/2004annual.pdf

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6. Government Agencies Publish Green Power Buying Guide
Fuel cells are listed as a green option for on-site power generation in the new "Guide to Purchasing Green Power," which is a joint product of DOE's Federal Energy Management Program, EPA's Green Power Partnership, the World Resources Institute's Sustainable Enterprise Program, and the Center for Resource Solutions' Green-e Renewable Energy Certification Program.
http://www.epa.gov/greenpower/buygreenpower/guide.htm

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7. Fuel Cell Projects Qualify for SIP Credits According to New Guidance Document
The Environmental Protection Agency has published a new air quality guidance document that describes how states and localities can estimate emission reductions from energy efficiency and renewable energy measures for inclusion in State Implementation Plans (SIPs). The guidance document lists fuel cells as a supply-side measure that would qualify for SIP credits to improve air quality in areas deemed to be in air quality "nonattainment" areas.
http://www.epa.gov/ttn/oarpg/t1/memoranda/ereseerem_gd.pdf

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RFP/Solicitation News
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8. Comments Sought on Expanded USDA Renewable Energy & Energy Efficiency Program
The U.S. Department of Agriculture has offered a Renewable Energy & Energy Efficiency Grant program in FY2003 and FY2004. For FY2005, the Agency is expanding the program to provide not only grants, but also loan guarantees and direct loans to farmers and ranchers or rural small businesses to purchase renewable energy systems and make energy efficiency improvements. The expanded program, which includes a grant section on hydrogen, has been offered as a Proposed Rule and is available online for public comment. Comments are due to the Agency on or before November 4, 2004. http://www.rurdev.usda.gov/rbs/farmbill/4280proposed.htm

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9. Solicitation to Fund Fuel Cell Projects in Arctic Environments
The University of Alaska Fairbanks Arctic Energy Technology Development Laboratory (AETDL) has issued a solicitation for projects to promote energy technologies in Arctic regions, including fuel cell projects. AETDL requests that individual proposals not exceed $350,000 per year in requested funding. Pre-proposals are required and have a deadline of November 19, 2004.
http://www.uaf.edu/aetdl/

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10. EMTEC Opens Round 2 of RFP on Materials to Support Fuel Cells, Hydrogen Economy
The Edison Materials Technology Center (EMTEC) has opened Round 2 of its Request for Proposals to develop improved materials to support fuel cells and the hydrogen economy. Awards per project will range from $80,000-$100,000. Pre-proposals are due November 24, 2004. Selected applicants will then be invited to submit full proposals by January 12, 2005.
http://www.emtec.org/Web%20Pages%20Emtec/Programs/Fuel%20Cells/fuel%20cells1.htm

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11. University Advanced Coal Solicitation Features Fuel Cell, Hydrogen Topics
Three fuel cell and hydrogen topics are featured in the new solicitation "Support of Advanced Coal Research at U.S. Colleges and Universities." Approximately $2.6 million is expected to be available for twelve to sixteen new awards under this solicitation. Applications must be received by November 30, 2004. http://www.netl.doe.gov/business/solicit/main.html#42244

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12. DOE Issues SBIR/STTR Solicitation with Hydrogen, Fuel Cell Topics & Subtopics
The DOE has released its 2005 Small Business Innovation Research / Small Business Technology Transfer (SBIR/STTR) solicitation, which features many fuel cell and hydrogen program areas and technical topics. Technical topics include Microbe-Based Hydrogen Production, Low-Cost High-Temperature Heat Exchangers for SOFC Systems, Advanced Materials and Technologies for Hydrogen Pipelines, and Advanced Materials for Hydrogen and Fuel Cell Technologies. http://sbir.er.doe.gov/sbir/

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Contract / Funding Awards
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13. DOE Announces $75 Million in Hydrogen Fuel Initiative Research Grants
The DOE announced the selection of recipients of $75 million in research grants in support of the Hydrogen Fuel Initiative. The projects involve 36 lead organizations and include more than 80 teaming organizations. Award topic areas include Solar Electrochemical Water Splitting, Delivery Technologies, and Analysis.
http://www.energy.gov/engine/content.do?PUBLIC_ID=16784&BT_CODE=PR_PRESSRELEASES&TT_CODE=PRESSRELEASE

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14. DOD STTR Phase I Award Selections Announced
Eight fuel cell and hydrogen projects received Phase I Awards through the 2004 STTR program, including projects on Selective Adsorbents for Fuel Cell Processors, A Compact Fuel Reformer for Undersea Vehicle Fuel Cells, and Metal-Organic Framework Adsorbents for Fuel Cells.
http://www.dodsbir.net/selections/sttr1_04.htm

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15. Climate Change Fuel Cell Awards Selected
Bonneville Power Administration announced the selection of 13 awardees to receive grants under the DOD Climate Change Fuel Cell Rebate Program, which awards $1,000 per installed kilowatt of fuel cell power. The total amount of funding awarded this year was $6 million. Names of grant recipients have not yet been released pending award finalizations; additional information will be available at http://www.bpa.gov/Energy/N/projects/fuel_cell/.

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16. ATP Program Awards Funding to Fuel Cell Projects
The Advanced Technology Program has announced recipients of funding for Innovative Technology R&D. Projects receiving funding include "Scalable Planar Solid-Oxide Fuel Cell Technology for Beyond 200 kW, High-Power Density Solid Oxide Fuel Cells for Aerospace Applications, and "Free Standing" Single-Wall Carbon-Nanotube Fuel Cell Electrode. The three projects received a total of more than $13.6 million in funding.
http://www.nist.gov/public_affairs/releases/atpaward09-04.htm

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17. EPA Funds Student Teams Researching Fuel Cells, Hydrogen

Through its People, Prosperity and the Planet (P3) competition, the Environmental Protection Agency is awarding $660,000 in research grants to 66 student teams for the 2004-2005 academic year. Six of the teams will focus on fuel cell or hydrogen projects, including a Novel Ru-Ni-S Electrode Catalyst for PEMFC, Design of an Anaerobic Digester and Fuel Cell System for Energy Generation from Dairy Waste, and Conversion of Wind Power to Hydrogen Fuel.
http://yosemite.epa.gov/opa/admpress.nsf/b1ab9f485b098972852562e7004dc686/6c90b8ad746fe80b85256f350069fcca!OpenDocument

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18. CCEF Selects Finalists for Fuel Cell Demonstration Funding
The Connecticut Clean Energy Fund has selected FuelCell Energy, Proton Energy Systems, Fuel Cell & Hydrogen LLC, and Anuvu Fuel Cell Products, to receive $3.4 million in funding to demonstrate the effectiveness of fuel cell system designs in Connecticut.
http://www.ctcleanenergy.com

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19. Special Operations Command Awards Contract to Jadoo
The U.S. Special Operations Command has awarded a contract to Jadoo Power Systems to develop fuel cells to reduce the weight of energy storage carried in the field by the military's Special Forces.
http://www.jadoopower.com/images/2ndlvl/PR_jadoo_SOCOM.pdf

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State Activities
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20. California Governor Opens First Retail Hydrogen Fueling Station
California Governor Arnold Schwarzenegger opened the first retail hydrogen fueling station on the state's Hydrogen Highway, a BP station at the Los Angeles International Airport.
http://www.governor.ca.gov/state/govsite/gov_htmldisplay.jsp?sCatTitle=%20&sFilePath=/govsite/spotlight/october22_update.html

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21. Minnesota Offers Grant for Fuel Cell Installation
The Minnesota Department of Commerce State Energy Office is offering a grant to help finance the demonstration of a Plug Power GenCore® fuel cell installation. Minnesota telecommunications companies and other businesses can apply. A workshop was held in September to inform state citizens about fuel cells and demonstrate a GenCore® fuel cell.
http://www.state.mn.us/mn/externalDocs/Commerce/Fall2004_102204022939_10-04Highlights.pdf

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22. Connecticut Launches Project 100
The Connecticut Clean Energy Fund has launched "Project 100," an initiative based on state legislation that calls for the contracting of a minimum of 100 MW of clean energy resources by July 1, 2007. An inaugural forum on the project is being scheduled for mid-November. Attendees of the forum will have the opportunity to provide comments on a draft RFP that will be release prior to the forum. http://www.ctcleanenergy.com/news/71.php

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Legislation / Regulations
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23. President Bush Signs Energy Tax Incentives Into Law
President Bush signed the American Jobs Creation Act of 2004, which creates and extends a number of energy-related tax credits. The bill contains a demonstration program – for green building and sustainable design projects on "brownfields" – that requires at least 25 megawatts of power in the program be generated by fuel cells.
http://thomas.loc.gov/cgi-bin/query/z?c108:H.R.4520:

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24. Minnesota PUC Establishes DG Interconnection Standards
The Minnesota Public Utilities Commission has issued an order establishing interconnection standards for distributed generation, which apply to systems up to 1 MW and above. PUC has set 60 kW as an exemption threshold for standby charges, and has given DG customers the option of purchasing less standby power than their own DG capacity.
http://www.puc.state.mn.us/docs/orders/04-0131.pdf

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Industry Headlines

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25. Toho Gas to Field-Test Residential Fuel Cell System
Toho Gas will introduce a residential fuel cell cogeneration system on a trial bases at houses in Japan starting at the end of fiscal year 2005. The 1-kW fuel cells will use hydrogen from city gas, and will generate usable hot water for the household.
http://www.fuelcelltoday.com/FuelCellToday/IndustryInformation/IndustryInformationExternal/NewsDisplayArticle/0,1602,5060,00.html

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26. PolyFuel Announces Membrane Breakthrough
PolyFuel announced it has achieved a breakthrough in fuel cell membranes by using an alternative material that it says costs half of current membrane prices. PolyFuel's membrane is a hydrocarbon membrane, which it says can run under a wider range of temperatures.
http://www.polyfuel.com/pressroom/press_pr_100504.html

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27. Kia Unveils Fuel Cell Vehicle
Kia Motors has unveiled the Kia Sportage FCEV fuel cell vehicle at the Paris Motor Show. The vehicle features an 80-kW fuel cell and a lithium ion polymer 152 volt battery. It has a top speed of 150 kmph and a range of 300 km.
http://www.channel4.com/4car/feature/motorshows/paris2004/concepts/kia-sport.html

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28. Plans for Ceramic Tape Facility Announced
ESL Electro-Science announced plans for a $1 million dedicated ceramic tape facility, to increase the ceramic tape capacity by almost 500% for use in solid oxide fuel cells.
http://www.electroscience.com/publications/pressrelease10-18-04.pdf

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University Activities

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29. ITS-Davis Joins California Fuel Cell Partnership

The University of California-Davis Institute of Transportation Studies has become the first academic institution to join the California Fuel Cell Partnership.
http://www.its.ucdavis.edu/e%2Dnews/issue21/#partnership

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30. 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)

Engineers at the University of Leeds' Energy Resources Research Institute have discovered a method for producing hydrogen from sunflower oil. Dr. Valerie Dupont, an energy engineer at the institute, said producing hydrogen from sunflower oil could provide a more environmentally friendly alternative by reducing these pollutants while offering an abundant, low cost and renewable resource that reduces dependence on foreign oil. (25-Aug-2004, *Yorkshire Evening Post*)

Researchers at the University of Houston's Texas Center for Superconductivity and Advanced Materials are working on a battery-like power source the size of two cans of soda with the ability to power an entire household while reducing its electric bill. They say their refinement of a breakthrough in thin-film solid oxide fuel cells could one day make power plants a thing of the past. (26-Aug-2004, *University Wire*)

Researchers from the University of Wisconsin have figured out how to use carbon monoxide as an additional source of energy in a hydrogen fuel cell system. The new chemical method has been reported in *Science* magazine. (5-Sept-2004, *The [Memphis, TN] Commercial Appeal*)

ITM Power of Cambridgeshire, set up to commercialize technology that emerged from a decade of research at the universities of Surrey and Cranfield, said it is on course to meet its target of producing a 500-W electrolyzer stack after its mark III version operated successfully at a power rating of more than 200 W during tests. It said that on the basis of these results, external consultants had estimated that its stack could approach the U.S. Department of Energy's cost target of $300 per kW of energy output. (10-Sept-2004, *The Engineer*)

Case Western Reserve University, with 45 fuel cell projects under way, is a key participant in Ohio Gov. Bob Taft's "Third Frontier Program," which focuses on two goals: growing clusters of fuel cell industries and stimulating early market demand for fuel cells. Local research projects also are under way at NASA Glenn Research Center, Cleveland State University and the University of Akron. (20-Sept-2004, *Crain's Cleveland Business*)

Case Western Reserve University has plans for an $8 million building to house the Cleveland Center for Structural Biology and the Power Partnership for Ohio, a fuel cell collaboration, on its West Quad, former site of Mt. Sinai Medical Center. (26-Sept-2004, *[Cleveland Plain Dealer*)

Canada's Hydrogen Early Adopters program has invested $935,000 in a project led by Fuel Cell Technologies Ltd. of Kingston, Ontario, that will demonstrate residential heating and power generation using four solid oxide fuel cells within a townhouse-style student residence at the University of Toronto at Mississauga. The Canadian government is investing $7.1 million in three hydrogen and hydrogen-compatible technology demonstration projects. (24-Sept-2004, *Canada NewsWire*)

The Institute for Integrated Energy Systems at British Columbia's University of Victoria has commissioned Palcan Power Systems Inc. to prepare and supply two scooters for comparative research purposes. One scooter will be a commercially available battery electric scooter and the second a similar scooter converted to fuel cell power by Palcan. The testing will result in improved system design models to be developed enabling fuel cell vehicle designers to optimize

fuel cell stack, fuel cell control systems, power balancing, and electric drive system design. (27-Sept-2004, *Business Wire*)

A research group from the Japan Atomic Energy Research Institute and the University of Tokyo has developed a new type of polymer membrane for solid-polymer fuel cells that retains its performance capabilities even under conditions of low humidity. The goal is to use this new membrane for solid-polymer fuel cells that can serve as power sources in cars and in portable information terminals. (28-Sept-2004, *Asia Pulse*)

Sapporo Breweries Ltd., Shimadzu Corp. and Hiroshima University say they have succeeded in a joint experiment to steadily generate hydrogen and methane gas using waste from the bread-making process. The first technology of its kind, which is also applicable to waste materials from production of other food products, is expected to be put into practical use in fiscal 2006 to contribute to the utilization of energy stored in organic matter, they said. (7-Oct-2004, *Japan Economic Newswire*)

Researchers at the University of Washington have developed a process to quickly convert even the smallest trees and branches into methanol, which is used as a power source for fuel cell technology. Demonstration projects are planned for Republic and Forks, Wash., and on the Yakama Indian Reservation. (9-Oct-2004, *Spokesman Review*, Spokane)

Midwest Optoelectronics, founded by University of Toledo professors to commercialize technologies developed there, was one of 36 companies in the nation to receive a grant under the U.S. Department of Energy's Hydrogen Fuel Initiative, a research program that promises to strengthen the nation's energy security and reduce greenhouse emissions. Midwest was awarded $ 2.9 million to help make hydrogen powered cars a reality. (14-Oct-2004, *The Blade*, Toledo, Ohio)

Volkswagen, Tongji University, and IAV (Ingenieurgesellschaft Auto und Verkehr GmbH) recently reached an agreement on the development of fuel cell vehicles. This is the first fuel cell vehicle project of Volkswagen in China. Volkswagen will be responsible for the supply of vehicles. Tongji University, a university in Shanghai, will be in charge of the supply of China-made batteries and system integration. IAV will provide the needed software. (15-Oct-2004, *Comtex News Network, Inc.*)

A research team led by the University of Delft in the Netherlands has found that hydrogen can be stored in ice-like water cages known as clathrate-hydrate structures. The Delft research team, which includes researchers from the Colorado School of Mines in Golden, Colo., and the University of Canterbury in Christchurch, New Zealand, looked at the unusual water lattice structures for hydrogen storage. They found that it is possible to stabilize crystalline water cages for hydrogen storage in binary clathrates using the chemical tetrahydrofuran. A second team from the University of Newcastle upon Tyne and the University of Liverpool in the U.K. has reported on a way to adsorb, or accumulate, the gas, at high pressure but hold it at lower pressures. The researchers have developed what they call microporous metal-organic framework materials with flexible linkers that allow high-pressure injection and low-pressure storage. (15-Oct-2004, *The Electricity Daily*)

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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

U.S. Fuel Cell Council -- The U.S. 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)