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## **FUEL CELL CONNECTION - November 2005 Issue**

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**News on U.S. Government Fuel Cell Programs**  
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*1. Protonex Unveils New Fuel Cell Soldier Power System*

Protonex Technology Corporation unveiled and demonstrated its next-generation 30-Watt fuel cell soldier power system, the P2. The system uses a fuel cell with a chemical hydride fueling subsystem based on technology licensed from Millennium Cell. Funding of the development of the system is provided by the Air Force Research Laboratory under the Dual Use Science and Technology Program and the Army Research Office.

<http://www.protonex.com/P2%20FINAL.pdf>

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*2. NETL Fuel Cell Manager Named Electrochemistry Society Fellow*

The Electrochemistry Society (ECS) has elected Dr. Mark Williams, Fuel Cells Technology Manager at the National Energy Technology Laboratory, as a Fellow, citing his "contributions to and promotion of electrochemical energy conversion technologies, especially fuel cells." Dr. Williams is NETL's first ECS Fellow.

<http://www.electrochem.org/awards/ecs/fellows.htm>

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*3. DOT Hydrogen Roadmap Approved*

The U.S. Department of Transportation Secretary Norman Y. Mineta recently approved the agency's Hydrogen Roadmap, which is the guiding document for DOT Hydrogen Safety Research, Development, Demonstration, and Deployment (RDD&D) programs. It outlines the roles and activities of each participating DOT operating administration, and serves as an outreach document for communication, coordination, and collaboration with other federal agencies, industry, the public, and Congress. [http://www.rita.dot.gov/publications/hydrogen\\_roadmap/](http://www.rita.dot.gov/publications/hydrogen_roadmap/)

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**RFP/Solicitation News**  
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*4. Hydrogen Fuel Projects Funding Available in New Mexico*

The Energy, Minerals and Natural Resources Department of New Mexico is requesting proposals for hydrogen fuel projects to be conducted in New Mexico, including production of hydrogen using wind, solar or fossil fuel, for a variety of end-use applications. A total of up to \$1 million is available under this RFP. Multiple contracts may be awarded. Deadline for applications is January 5, 2006.

<http://www.newmexicohydrogen.org/pressrelease/PUBLIC%20NOTICE.htm>

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*5. SEED Round 3 Solicitation to Fund Clean Energy Companies*

The Massachusetts Renewable Energy Trust has opened the third round of competitive funding opportunities for early-stage clean energy companies in Massachusetts, through the Sustainable Energy Economic Development initiative (SEED). Up to \$500,000 of funding in the form of a convertible loan is available. Deadline for applications is January 10, 2006. There is an optional Bidder's Conference on December 7, 2005

<http://www.masstech.org/SEED>  
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6. *Large Onsite Renewables Initiative Funding Available for Fuel Cells*

The Massachusetts Technology Collaborative is seeking applications for the Large Onsite Renewables Initiative Feasibility Study/Design & Construction Grants. Fuel cells utilizing any fuel source are eligible for funding. Round 1 has \$3.5 million available. Feasibility Grants are capped at \$40,000, while Design Grants are capped at the lesser of \$75,000 or 75% of actual cost, and Construction Grants are capped at the lesser of \$500,000 or 75% of actual costs. Projects must have a greater than 10-kW capacity. Applications are due January 12, 2006. Deadline for written questions is December 15, 2005.

[http://www.masstech.org/renewableenergy/large\\_renewables.htm](http://www.masstech.org/renewableenergy/large_renewables.htm)

7. *CCEF Accepting Proposals for Operational Demonstration Program*

The Connecticut Clean Energy Fund is accepting proposals for its new \$4 million Operational Demonstration Program, which will enable early-stage companies to demonstrate the effectiveness of their near-commercial clean energy technologies. The program will provide funding opportunities of up to \$500,000 per project to help companies install and test their technologies in real-world operating environments. Applications are due January 31, 2006.

[http://www.ctcleanenergy.com/funding/operational\\_demo\\_program.html](http://www.ctcleanenergy.com/funding/operational_demo_program.html)

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**Contract / Funding Awards**  
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8. *RPI Receives Funding for Robotic Assembly of Fuel Cells*

The Rensselaer Polytechnic Institute's Flexible Manufacturing Center and Center for Automation Technologies and Systems recently received funding from the Robotics Industries Association and the National Science Foundation for a project to develop a flexible robotic process to produce fuel cell stacks.

[http://news.rpi.edu/update.do?artcenterkey=1166&setappvar=page\(1\)](http://news.rpi.edu/update.do?artcenterkey=1166&setappvar=page(1))

9. *DOE Awards Phase III Grant to Solar Hydrogen Generation Project*

DOE has awarded a \$2.5 million Phase III grant to Altair Nanotechnologies and the University of Nevada Las Vegas Research Foundation for the joint development of solar hydrogen generation cells. The project will continue through December 2006.

<http://www.b2i.us/profiles/investor/ResLibraryView.asp?BzID=546&ResLibraryID=12594&Category=24>

10. *North Dakota Commission Awards Funding for National Center for Hydrogen Technology*

The North Dakota Centers of Excellence Commission awarded \$2.5 million to the Energy & Environmental Research Center (EERC) at the University of North Dakota to build a new facility for the EERC's National Center for Hydrogen Technology.

<http://www.renewableenergyaccess.com/rea/news/story?id=38677>

11. *Universities Receive \$1.35 Million in Grants from DOE*

Researchers from the University of Georgia and the University of California, Santa Cruz, received \$1.35 million in grants from the DOE to collaborate on clean energy technologies that incorporate nanostructures for more efficient hydrogen production and storage.

<http://www.renewableenergyaccess.com/rea/news/story?id=39028>

12. *SECA Grant Awarded to Franklin Fuel Cells*

Franklin Fuel Cells has received a \$100,000 Phase-One grant from DOE's Solid-State Energy Conversion Alliance for the company's novel, patented cathode technology. Franklin Fuel Cells' Copper-based SOFC technology was initially developed by a team of scientists at the University of Pennsylvania.

[http://www.franklinfuelcells.com/press\\_release\\_10.17.05.htm](http://www.franklinfuelcells.com/press_release_10.17.05.htm)

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**Legislation / Regulation**  
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*13. California Extends Net Metering for Fuel Cells*

A new California law has removed the repeal date for utility tariffs that apply to net-metered fuel cells. The new law, AB 67, states that fuel cells commencing operation before January 1, 2010, may net meter for the operating life of the system.

[http://www.leginfo.ca.gov/pub/bill/asm/ab\\_0051-0100/ab\\_67\\_bill\\_20051006\\_chaptered.pdf](http://www.leginfo.ca.gov/pub/bill/asm/ab_0051-0100/ab_67_bill_20051006_chaptered.pdf)

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*14. Detroit Edison Allows Fuel Cells to Net Meter*

The Michigan Public Service Commission approved a request by Detroit Edison to allow the utility to include fuel cells and sterling engines – up to 30 kilowatts in size – in its net-metering tariff.

<http://efile.mpsc.cis.state.mi.us/efile/docs/14346/0047.pdf>

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*15. CARB Limits Heavy Duty Truck Idling, Allows Alternative APUs*

The California Air Resources Board passed a regulation adding heavy-duty trucks with sleeper cabs to the current prohibition on diesel engines idling for more than 5 minutes. One component of the new rule allows for the use of alternative technologies to provide power for “cab comfort” and on-board accessories in sleeper berth equipped trucks.

<http://www.arb.ca.gov/newsrel/nr102405.htm>

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**Industry Headlines**  
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*16. USFCC Fuel Cell Industry Survey Finds Consistently Strong Sales*

The US Fuel Cell Council's latest Worldwide Fuel Cell Industry Survey found consistently strong sales from 2003 to 2004, with steady increases in research and development expenditures.

Reported sales of fuel cell products, parts and services for 2004 were \$331 million.

<http://www.usfcc.com/resources/EM.2005WorldwideFuelCellSurvey.PressRelease.pdf>

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*17. Hydrogenics Completes Fuel Cell Forklift Trials at GM and FedEx*

Hydrogenics Corporation announced the successful completion of fuel cell-powered forklift trials at General Motors and FedEx facilities in Canada. The forklifts operated full-time for three months.

<http://www.hydrogenics.com>

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*18. Fuel Cells 2000 Unveils Searchable Fuel Cell Installation Database*

Fuel Cells 2000 has developed a searchable database of worldwide stationary fuel cell installations. The database is freely accessible through the organization's web site.

<http://www.fuelcells.org>

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*19. Remote Control System Developed for Fuel Cells in Surveillance Applications*

SFC Smart Fuel Cells has developed a remote control system for operating fuel cells in surveillance applications.

[http://www.smartfuelcell.de/index.php?id=146&L=1&tx\\_ttnews\[tt\\_news\]=83&tx\\_ttnews\[backPid\]=1&cHash=d509f70a52](http://www.smartfuelcell.de/index.php?id=146&L=1&tx_ttnews[tt_news]=83&tx_ttnews[backPid]=1&cHash=d509f70a52)

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**University Activities**  
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*20. 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))

Eric Blom, a high school senior with an interest in fuel cells, was one of only 12 students in the state to be chosen as an Indiana Academy of Science Talent Search finalist. "It's a pretty big deal," said Adams High School science teacher Nevin Longenecker. "They only have 12 students from the state that they invited down." Longenecker said there were likely 70 to 80 students who competed statewide. Blom's paper was titled "Construction of a Prototype Microbial Fuel Cell and its Performance with Various Anodes and Biofilms." [26-Oct-05, *South Bend Tribune* (Indiana)]

The inventor of the blue LED, in conjunction with a research team from Tokyo University of Science, say that they have succeeded in producing hydrogen from water through the use of gallium nitride (GaN) crystals. If this technology can be commercialized, it is expected to lead to the development of fuel cells that run on water and can be used in a wide range of products, from automobiles to computers. GaN crystals are being studied for such uses as light sources for next-generation DVD devices. This is part of a Japan Science and Technology Agency research program overseen by Shuji Nakamura, who created the blue LED and now works as professor of materials at the University of California, Santa Barbara. The researchers connected GaN crystals with platinum using wire, then immersed these in water. When light is applied to the GaN, electricity flows through the water and causes it to decompose into oxygen and hydrogen through electrolysis. The rate of conversion efficiency, which is the ratio of hydrogen produced to the energy used to shine the light, is still a low 0.5 per cent to 0.7 percent. "Theoretically, this can be raised to more than 20 percent," said Kazuhiro Ohkawa, a professor in the physics department at the Tokyo University of Science, who played a leading role in the research. The minimum conversion efficiency needed for commercialization is said to be 20 percent. [27-Oct-05, *Asia Pulse*]

For the past two years, the New York Institute of Technology and the U.S. Merchant Marine Academy have been working on an advanced solar hydrogen home to demonstrate regenerative energy production and sustainability. David Schieren, a graduate energy-management student from NYIT, testified about the so-called "Green Machine/Blue Space" project to the Committee on House Science Subcommittee on Energy on Nov. 2. "Green Machine" refers to the residential "life support" system and "Blue Space" to the dwelling. The project was created for The 2005 Solar Decathlon, in which 18 teams of college and university students from around the globe participated in a competition to design, build, and operate the most attractive and energy-efficient solar-powered home. The University of Colorado, Denver and Boulder, successfully defended the championship and took first place overall. Cornell University was the second-place team, and California Polytechnic State University finished third. The U.S Department of Energy's [Office of Energy Efficiency and Renewable Energy](#) is the primary sponsor of the Solar Decathlon. [2-Nov-05, Federal Document Clearing House Congressional Testimony and [http://www.eere.energy.gov/solar\\_decathlon/](http://www.eere.energy.gov/solar_decathlon/)]

The University of Texas System will host the first high-temperature nuclear reactor in the country by 2012. The new reactor, which will be used to test and conduct research for a proposed commercial reactor in Idaho, will have three primary experimental uses: nuclear research on the fuel cycle, which follows uranium usage from start until finish; hydrogen production; and high-temperature research. The UT campus at Permian Basin in Odessa, Texas, is working with the nuclear consulting company General Atomics to build the test reactor in Andrews County in West Texas. Andrews County recently became home to all of the nation's low-level radioactive waste. [3-Nov-05, *Daily Texan* via University Wire]

Kyoto University and Japan's Ministry of the Environment are working with the city of Kyoto on a pilot project to generate electricity from fuel cells that use hydrogen derived from untreated household garbage. There are other research projects on biomass power generation, but this is the first attempt in Japan to produce hydrogen from raw garbage for use in fuel cell power generation, according to Kyoto officials. Organizers of the project aim to put their garbage-based power generation scheme into practical use in fewer than 10 years. By 2013, Kyoto plans to build a biogas generation facility that is expected to help generate electricity for 18 million households by using 60 tons of raw garbage a day to be collected from 160,000 households, the officials said. [07-Nov-05, *Jiji Press Ticker Service*]

Three members of the Minneapolis-based Upper Midwest Hydrogen Initiative (UMHI) unveiled the first hydrogen-powered ice re-surfacer in early November at the University of North Dakota's Energy & Environmental Research Center. The unveiling was part of a Hydrogen Energy Summit sponsored by U.S. Sen. Byron Dorgan, who led development of the hydrogen and fuel cell portions of the Energy Policy Act of 2005 recently passed by Congress. UMHI members involved in the "eP-Ice Bear" project include ePower Synergies, Inc., Kraus Global, and the University of North Dakota Energy & Environmental Research Center (EERC). The EERC's National Center for Hydrogen Technologies is leading the demonstration and providing technical and logistical services in addition to some funding. Resurface Corporation manufactured the "Ice Bear" ice refinisher that the project team converted to run on a hydrogen fuel cell. [10-Nov-05, *Great Plains Institute*]

Among those working on hydrogen fuel cell design is Bruce Tatarchuk, a chemical engineering professor and director of the Center for Microfibrous Materials Manufacturing for the Samuel Ginn College of Engineering at Auburn University in Alabama. According to a published report, Tatarchuk said the chemical engineering department is focusing on fuel reformation. "A lot of what we do deals with how to take liquid hydrocarbon fuel cells and catalytically reforming them to produce a very pure form of hydrogen," Tatarchuk said. [10-Nov-05, *The Auburn Plainsman* via University Wire]

Enviromech Industries Inc., a wholly owned subsidiary of EPOD International Inc., recently announced the sale of a powerPACK™ Hydrogen Fuel System to the University of Waterloo for the university's winning entry in the General Motors and U.S. Department of Energy-organized Challenge X competition. The University of Waterloo won Challenge X for its fuel cell-powered Chevrolet Equinox design in the first year of the three-year competition. Waterloo will now build its design into the vehicle test phase scheduled for the summer of 2006. For more information about the Challenge X project, see <http://www.challengex.org>. [14-Nov-05, *Market Wire*]

The University of Connecticut School of Engineering (Storrs Campus) recently purchased and installed two SGI® Altix® systems from Silicon Graphics, which will be used in part to understand highly coupled fluid dynamics, species transport and the electrochemical kinetics of fuel cells. [15-Nov-05, *PR Newswire US*]

Scientists at the Technical University of Denmark have developed a storage tablet that will enable transport of hydrogen in solid form. "Should you drive a car 600 km using gaseous hydrogen at normal pressure, it would require a fuel tank with a size of nine cars," said DTU Chemistry Professor Claus Hviid Christensen. "With our technology, the same amount of hydrogen can be



stored in a normal gasoline tank." "The technology is a step towards making the society independent of fossil fuels," says Professor Jens Nørskov, director of the Nanotechnology Center at DTU. Nørskov, Christensen, Tue Johannessen, Ulrich Quaade and Rasmus Zink Sørensen are the five researchers behind the invention. Together with DTU and SeeD Capital Denmark, the researchers have founded the company Amminex A/S, which will focus on the further development and commercialization of the technology. [15-Nov-05, NewEnergyReport.org]

BTU International, Inc. recently entered into a licensing and joint development agreement with Boston University that will focus on improving processes used to manufacture solid oxide fuel cells. The technology is applicable to both high-temperature and intermediate-temperature material systems. The development program will be conducted in BU's Manufacturing Engineering Department by professors Uday Pal and Srikanth Gopalan. [16-Nov-05, *Business Wire*]

The Oklahoma Fuel Cell Initiative Task Force recommends opening a new research center at Oklahoma University's Sarkeys Energy Center to study the development of a hydrogen delivery system using existing infrastructure. The task force, established in August 2002, released a series of recommendations during a press conference in early November. [19-Nov-05, *Tulsa World*]

Sixteen European universities are cooperating to create a hydrogen-transport zone called "Zero Region" in Europe. The project provides industrial hydrogen production and the establishment of a network of hydrogen fuel stations in parts of Italy and Germany, according to the news agency Efir Inform. Project partners will cooperate in technical support development, such as industrial systems hydrogen storage, and hydrogen for fuel cell vehicles. [25-Nov-05, Bellona Foundation]

India and Korea have entered into a memorandum of understanding to pursue hydrogen and fuel cell research. The Fuel Cell Research Centre in the Korea Institute of Science and Technology (KIST) is Korea's largest public research-and-development management organization for promoting the development of advanced energy and energy conservation technologies. The R&D Centre of Indian Oil Corporation has been nominated to coordinate hydrogen research on behalf of the oil and gas sector in India. [25-Nov-05, *FuelCellWorks*]

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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](mailto:bernie@usfcc.com).

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*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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