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**FUEL CELL CONNECTION - June 2009 Issue**  
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IN THIS ISSUE

- * DOE Issues RFI on CHP and APU Fuel Cell Applications – June 30 Deadline
- * \$156 Million for Deployment of CHP and Other Industrial Energy Efficiency Technologies
- * \$358 Million in ARRA Funding Awarded for State Energy Programs in 14 States
- * NETL Report Details SECA Accomplishments
- * Fuel Cells for Forklift Trucks Sold Under DOE Market Transformation Initiative

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CONTENTS

News on U.S. Government Fuel Cell Programs

1. NETL Report Details SECA Accomplishments
2. Fuel Cells for Forklift Trucks Sold Under DOE Market Transformation Initiative
3. Proceedings from DOE Hydrogen Program 2009 Annual Merit Review Now Online

RFP / Solicitation News

4. DOE Issues RFI on CHP and APU Fuel Cell Applications – June 30 Deadline
5. \$156 Million for Deployment of CHP and Other Industrial Energy Efficiency Technologies
6. \$50 Million in Funding to Improve Energy Efficiency of Telecommunications and Data Centers
7. TACOM Issues Presolicitation for Micro-Fibrous Catalyst/Sorbent R&D
8. Deadline to Apply for Clean Renewable Energy Bonds Extended to August 4, 2009
9. Alternative/Renewable Energy is Cross-Cutting Priority in USDA 2010 SBIR Solicitation
10. Grant Opportunity for Efficient Class 8 Trucks and Advanced Light-Duty Vehicle Powertrains

Contract / Funding Awards

11. Protonex Receives \$500,000 from NRL for UAV Fuel Cell Systems
12. DOD Selects Plug Power to Supply Fuel Cells to Power Lift Trucks

State Activities

13. \$358 Million in ARRA Funding Awarded for State Energy Programs in 14 States
14. Fuel Cell Challenge Program Results in Fuel Cell-Powered Radio Network
15. Maine Expands Net Metering to Increase System Size, Encompass Micro-CHP Technologies
16. Kansas Establishes Renewable Portfolio Standard, State-Wide Net Metering

Industry News

17. Linde Group Developing Process to Generate Hydrogen from Glycerine
18. Tests Show Medis Fuel Cell Twice as Powerful as Current Military Battery Technology

University Activities

19. Virginia Tech Researcher Invents Glass-Based Seal for SOFCs
20. OSU Team Wins First Year of EcoCAR Challenge

21. University Fuel Cell Roundup

Administration

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News on U.S. Government Fuel Cell Programs

1. NETL Report Details SECA Accomplishments

The National Energy Technology Laboratory (NETL) has published a report on its 2008 Accomplishments, including details on its fuel cell work through the Solid-State Energy Conversion Alliance (SECA). Accomplishments include development of new interconnect materials for SOFCs, achievement of 80 percent fuel utilization by an SOFC system, and successful proof-of-concept testing of a biomass power system consisting of an SOFC thermally integrated with a gasifier.

http://www.fossil.energy.gov/news/techlines/2009/09035-NETL_Releases_Accomplishments_Repo.html

2. Fuel Cells for Forklift Trucks Sold Under DOE Market Transformation Initiative

With partial funding from the U.S. Department of Energy (DOE) Hydrogen and Fuel Cell Market Transformation Initiative, H-E-B has purchased 14 PowerEdge™ fuel cell systems and a PowerTap™ Hydrogen Generator and Hydrogen Station from Nuvera Fuel Cells. The fuel cells will power Class II forklift trucks in the company's distribution center operations.

http://www.nuvera.com/news/press_release-45.php

3. Proceedings from DOE Hydrogen Program 2009 Annual Merit Review Now Online

The proceedings and presentations from the 2009 Annual Merit Review and Peer Evaluation of the DOE Hydrogen Program and Vehicle Technologies Program are now available online. DOE reports that more than 1500 participants attended the meeting, which was held in May 2009, and reviewed 625 hydrogen, fuel cell, and vehicle technology projects funded by DOE.

http://www.hydrogen.energy.gov/news_20090612.html

RFP/Solicitation News

4. DOE Issues RFI on CHP and APU Fuel Cell Applications – June 30 Deadline

DOE has issued a Request for Information (RFI) titled "Targets for Combined Heat and Power and Auxiliary Power Unit Fuel Cell Applications." DOE seeks input from stakeholders and the research community on proposed technical targets for those specific fuel cell applications, in order to assist the Department in "refining performance, durability, and cost targets." There is no funding associated with this RFI. Responses are due June 30, 2009.

http://www.hydrogen.energy.gov/news_20090529.html

5. \$156 Million for Deployment of CHP and Other Industrial Energy Efficiency Technologies

The DOE Industrial Technologies Program announced a new solicitation titled "Recovery Act: Deployment of Combined Heat and Power (CHP) Systems, District Energy Systems, Waste

Energy Recovery Systems, and Efficient Industrial Equipment,” in support of the American Recovery and Reinvestment Act (ARRA). The funding will enable deployment of industrial technologies that provide 25% or greater improvement in energy efficiency over the equipment currently in use. Approximately \$156 million in funding is expected to be available for awards under this announcement. Minimum award sizes vary depending on Area of Interest. There is no maximum amount for individual awards. Deadline for responses is July 14, 2009.

<http://www.grants.gov/search/search.do?mode=VIEW&flag2006=false&opId=47763>

6. \$50 Million in Funding to Improve Energy Efficiency of Telecommunications and Data Centers
DOE's Industrial Technologies Program announced the availability of \$50 million in funding to improve the energy efficiency of U.S. telecommunications and data centers, with an emphasis on new technologies that can be commercialized within the next five years. The three areas of interest are "Concept Definition Studies for Energy Efficient Information and Communications Technology," "Information and Communications Technologies R&D for Energy Efficiency," and "Demonstration and Field Testing of Highly Energy Efficient and Emerging Technologies for Data Center or Telecommunication Use." The maximum award for a single project under this announcement is \$10 million. DOE anticipates making 5-15 awards under this announcement. Deadline for proposals is July 21, 2009.

<http://www07.grants.gov/search/search.do?&mode=VIEW&flag2006=false&opId=47742>

7. TACOM Issues Presolicitation for Micro-Fibrous Catalyst/Sorbent R&D

The U.S. Army Tank-Automotive Command (TACOM) - Warren Acquisition Center has issued a presolicitation notice for a contract to "research and develop new materials and filtration structures for fuel reformers, desulfurizers and fuel cell systems." The presolicitation lists a response date of July 28, 2009, and a point of contact, Harjeet Oberoi, Ph. 586-753-2846.

https://www.fbo.gov/index?s=opportunity&mode=form&id=a13e1a6c1e91b29dc2e24dd6df76ea88&tab=core&_cview=0

8. Deadline to Apply for Clean Renewable Energy Bonds Extended to August 4, 2009

The deadline to apply for Clean Renewable Energy Bonds, which provide low-interest financing for renewable energy projects, has been extended to August 4, 2009. The American Recovery and Reinvestment Act of 2009 (ARRA) expanded funding for CREBs to \$2.4 billion of new allocations, of which \$800 million is for state, local, and tribal governments, \$800 million is for public power providers, and \$800 million is for electric cooperatives.

http://apps1.eere.energy.gov/state_energy_program/update/feature_detail.cfm/fid=89

9. Alternative/Renewable Energy is Cross-Cutting Priority in USDA 2010 SBIR Solicitation

The U.S. Department of Agriculture (USDA) has issued its 2010 Small Business Innovation Research (SBIR) solicitation, which includes as a cross-cutting priority Energy Efficiency and Alternative and Renewable Energy, including production of hydrogen and other fuel gases from agricultural waste. The solicitation lists 8 specific research topics of interest, including Biofuels and Biobased Products. USDA expects to make approximately 85 Phase I awards of up to \$90,000 each. Applications are due September 3, 2009.

http://www.csrees.usda.gov/funding/rfas/sbir_rfa.html

10. Grant Opportunity for Efficient Class 8 Trucks and Advanced Light-Duty Vehicle Powertrains

DOE announced \$240 million for development of high efficiency Class 8 trucks and advanced technology powertrains for light-duty vehicles. In the first area of interest, the goal is to develop and demonstrate a 50% improvement in overall freight efficiency on a heavy-duty Class 8 tractor trailer. In the second area of interest, DOE seeks "to accelerate development of cost-competitive engine and powertrain systems for light-duty vehicles capable of attaining breakthrough thermal

efficiencies while meeting future emissions standards.” Per project awards are expected to be between \$45,000 and \$95,000. The closing date for applications is September 9, 2009.
<http://www07.grants.gov/search/search.do;jsessionid=ZhshKGrhPxKWFjL0Q2NKyR2XGTsPNdK9sfkd8ljdW7kDK3vHbqG!1215949849?oppld=47867&flag2006=false&mode=VIEW>

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**Contract / Funding Awards**  
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11. Protonex Receives \$500,000 from NRL for UAV Fuel Cell Systems

The U.S. Naval Research Laboratory (NRL) has awarded \$500,000 to Protonex Technology Corporation for advanced development of fuel cells for small unmanned aerial vehicles (UAVs). The funding is an extension of an existing contract, and will focus on incorporating and testing the fuel cell power system in a tactical UAV.

<http://www.protonex.com/assets/pressrelease/8fc7457a-6bc0-45df-abb1-9e7a5133d39b.pdf>

12. DOD Selects Plug Power to Supply Fuel Cells to Power Lift Trucks

The U.S. Department of Defense (DOD) has selected Plug Power to provide 19 class 1 GenDrive™ fuel cell power units and two years of managed services for a demonstration project at the U.S. Army’s Forces Command in Fort Lewis, Washington. The fuel cells will be used to power a fleet of sit-down counterbalanced lift trucks. The project will study and assess the use of wastewater treatment plant digester gas as a source of hydrogen for the fuel cells.

<http://www.b2i.us/View.asp?b=604&ID=67721&l=204573>

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**State Activities**  
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13. \$358 Million in ARRA Funding Awarded for State Energy Programs in 14 States

In two separate press releases, DOE Secretary Steven Chu announced more than \$358 million in ARRA funding will be awarded to State Energy Programs in fourteen states. Funding will be used to support energy efficiency and renewable energy projects, including plans to increase the use of renewable energy, prioritize energy savings, and create or retain jobs.

http://apps1.eere.energy.gov/news/progress_alerts.cfm/pa_id=190

http://apps1.eere.energy.gov/news/progress_alerts.cfm/pa_id=191

14. Fuel Cell Challenge Program Results in Fuel Cell-Powered Radio Network

As part of the 2009 Greater Columbia (South Carolina) Fuel Cell Challenge program, Dantherm Power successfully installed a hydrogen fuel cell backup power system for the City of Columbia’s radio network. The fuel cell will ensure network availability even in the event of loss of electric utility power. Two additional communications sites will be upgraded to fuel cell systems in 2009.

<http://www.dantherm-air-handling.com/>

15. Maine Expands Net Metering to Increase System Size, Encompass Micro-CHP Technologies

Maine Governor John Baldacci signed a reform bill on net metering, increasing the eligible system size to 660 kW and expanding the list of eligible technologies to include micro-CHP with any technology and any fuel. CHP systems from 31 kW to 660 kW are eligible to net meter if they achieve a minimum of 65% efficiency.

http://www.mainelegislature.org/legis/bills/bills_124th/chappdfs/RESOLVE20.pdf

16. Kansas Establishes Renewable Portfolio Standard, State-Wide Net Metering
Kansas Governor Mark Parkinson signed HB 2369, which establishes a renewable portfolio standard, requiring utilities to acquire 20% renewable energy by 2020. The law also allows for residential systems up to 25 kW and non-residential systems up to 200 kW to be eligible for net metering, including systems powered by fuel cells using hydrogen produced by renewable energy sources.
<http://www.kslegislature.org/bills/2010/2369.pdf>

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**Industry News**  
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17. Linde Group Developing Process to Generate Hydrogen from Glycerine
The Linde Group announced it is developing a process to generate hydrogen from feedstock glycerine, a byproduct of biodiesel production. The raw glycerine will be processed to produce a hydrogen-rich gas that will be purified and liquefied for use in German cities where hydrogen is being used as a fuel.
<http://www.linde.com/international/web/linde/like35lindecom.nsf/0/91F7196358F928B2C12575A0002C5781>

18. Tests Show Medis Fuel Cell Twice as Powerful as Current Military Battery Technology
Recent tests of fuel cell technology by Medis Technologies, under a broad range of temperatures and environments, showed the fuel cells to be twice as powerful as current military battery technology. The fuel cells were tested with common military applications, including tactical radios. At -20 degrees Celsius, the fuel cell system retained 90 percent of the performance of ambient conditions. At +50 degrees Celsius, the system performance was the same as ambient.
<http://www.medistechnologies.com/Portals/Medistech/DataFiles/Documents/062209%20Portable Power.pdf>

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**University Activities**  
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19. Virginia Tech Researcher Invents Glass-Based Seal for SOFCs
Peizhen Lu, assistant professor of materials science and engineering at Virginia Tech, has invented a new glass that can be used to seal SOFC modules and the stack. According to a university press release, "The self-healing seal glass will provide strength and long-term stability to the stack." Lu's work on SOFC and solid oxide electrolyzer cells has been supported by funding from the U.S. Department of Energy.
<http://www.vtnews.vt.edu/story.php?relyear=2009&itemno=443>

20. OSU Team Wins First Year of EcoCAR Challenge
A team of students from The Ohio State University won the first year of the EcoCAR Challenge, sponsored by DOE and General Motors, with a design for reengineering a 2009 Saturn VUE to be powered by a 1.8 liter engine and fueled by E85 ethanol. The design predicts a 300% increase in fuel economy over the production 4 cylinder vehicle. Seventeen universities competed in this first year of the three-year competition, with two university teams designing Fuel Cell Plug-in Hybrid Vehicles that use an onboard hydrogen fuel cell to either propel the vehicle or recharge a battery

pack. The next stage of the competition is for student teams to incorporate their powertrains into the Saturn VUE. The final year will involve refinement of the vehicles to near-showroom quality.
http://www.ecocarchallenge.org/docs/2009_toronto_winners.pdf

21. 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)

The Hayward Campus of California State University, East Bay is under consideration as a future site for the placement of a \$7 million fuel cell to be provided and paid for by Pacific Gas and Electric Company, the campus announced May 13. San Francisco State University also is under consideration.

<http://www20.csueastbay.edu/news/2009/05/fuelcell-051309.html>

By creating a model of the active site found in a naturally occurring enzyme, chemists at the University of Illinois have described a catalyst that acts like nature's most pervasive hydrogen processor. The researchers describe their work in a paper accepted for publication in the *Journal of the American Chemical Society*, and posted on the journal's Website.

<http://news.illinois.edu/news/09/0518catalyst.html>

University of Virginia (UVA) doctoral student Rosemary Ann Cox-Galhotra is one of two UVA students to receive National Science Foundation graduate fellowships starting with the 2009-10 academic year. The three-year fellowships provide about \$30,000 to each student each year. Cox-Galhotra's chemical engineering research focuses on the physical and electrochemical characterization of thin-film model electrodes of SOFCs. She is a member of the research team of assistant professor Steven McIntosh.

<http://www.virginia.edu/uvatoday/newsRelease.php?id=8799>

Brett Anitra Gilbert, assistant professor of management at Mays Business School at Texas A&M University, has been chosen as one of five recipients of the annual Kauffman Junior Faculty Fellowship in Entrepreneurship Research. The fellowship will provide Texas A&M with a grant of \$50,000 over two years to support Gilbert's research activities. "What I'm trying to understand is whether or not clustering helps to encourage or discourage innovation," said Gilbert. The funds will accelerate her research as she compares regions where hydrogen and fuel cells are and are not being developed.

<http://tamunews.tamu.edu/archives/article.php?articleid=7763&month=5&year=2009>

Johannes Gutenberg University Mainz and the Dalian Institute of Chemical Physics, Chinese Academy of Sciences will cooperate on the development of new chemical process technologies including the production of ionic liquids. The subject of the new cooperation agreement are so-called liquid salts, suitable for many applications such as dissolving cellulose in the paper industry, desulphurizing crude oil, replacing toxic or hazardous solvents, or for use as electrolytes in batteries and fuel cells.

<http://www.uni-mainz.de/eng/13137.php>

Using microbial fuel cells to convert wastewater into energy has earned Bruce Logan, Kappe professor of environmental engineering, Penn State, the 2009 National Water Research Institute's Athalie Richardson Irvine Clarke Prize for excellence in water research. The prize includes a medallion and \$50,000 and is awarded annually. Logan is the 16th recipient.

<http://live.psu.edu/story/39966>

Donald G. Baird, professor of chemical engineering at Virginia Polytechnic Institute and State University, is the recipient of the 2009 Society of Plastics Engineers' (SPE) International Award, the highest honor SPE bestows upon a member. Dr. Baird is developing materials that are highly

conductive, yet can be processed by means of compression molding, to form bipolar plates for fuel cells, according to a report distributed by *Targeted News Service*.

<http://www.vtnews.vt.edu/story.php?relyear=2009&itemno=446>

Researchers with the Global Information and Telecommunications Institute at Japan's Waseda University have used patent data to analyze research and development efficiency and innovation in Japanese companies focusing on fuel cell technologies. The findings by Junichi Sakata and colleagues are published in the June 2009 issue of the online journal *R&D Management*.

<http://www3.interscience.wiley.com/journal/122393479/abstract>

Nanyang Technological University in Singapore has established a broad-based multidisciplinary energy research center that seeks to explore complex energy-related issues. The new Energy Research Institute @ NTU will encompass up to six research centers and institutes to address different energy-related issues. The first center to be set up is the Centre for Sustainable Energy Research where researchers will investigate advanced fuel cells, charge storage, wind/tidal energy and energy efficiency and smart buildings.

http://news.ntu.edu.sg/pages/newsdetail.aspx?URL=http://news.ntu.edu.sg/news/Pages/NR2009_Jun02.aspx&Guid=eaa322e6-f43a-4855-9ce9-5a43a2ac3482&Category=News+Releases

Caisheng Wang, an assistant professor of electrical and computer engineering at Wayne State University in Michigan, has received a National Science Foundation grant to develop a control strategy for using electricity generated by power plants as well as alternative energy distributed generation sources including wind turbines, solar panels and fuel cells.

<http://media.wayne.edu/2009/06/02/wayne-state-researcher-developing-strategy-for-integrating>

Katayun Barmak, professor of materials science and engineering at Carnegie Mellon University, with the help of Microscopy Lab Supervisor Thomas Nuhfer, is one of the first materials scientists worldwide to successfully map polycrystalline structures on a nanoscale, the university announced June 4. "I can see major impacts from our work for a whole host of engineered systems that harness nanotechnology," Barmak added. She said some examples of those important systems include silicon chips and data storage systems, photovoltaics and fuel cells, and medical devices and drug delivery systems.

http://www.cmu.edu/news/archive/2009/June/june4_barmak.shtml

The University of Maryland College Park received \$250,000 to fund a research project led by Reza Ghodssi, in collaboration with the University of Maryland Biotechnology Institute, titled, "A Micro-Direct Methanol Fuel Cell with Nanostructured Platinum Catalysts Using the Tobacco Mosaic Virus." The project was one of 12 funded by 2009 Maryland Nanobiotechnology Research and Industry Competition Grants.

<http://www.choosemaryland.org/pressroom/pressreleases/2009%20Press%20Releases/nanobiot echgrants.html>

Al Gates, of Moodus, the head of the mechanical engineering department at Central Connecticut State University in New Britain, was selected to spend nearly a month at FuelCell Energy in Danbury working on the design and development of a one megawatt SOFC. Gates, who has been teaching for 15 years, was one of eight Connecticut high school and college teachers who will spend part of their summer working at manufacturing companies to learn about workplace technology. Each received a \$4,000 stipend. The Connecticut Business & Industry Association administers the program on behalf of the Connecticut Community Colleges' College of Technology Regional Center for Next Generation Manufacturing, which is funded by the National Science Foundation.

<http://www.cbia.com/newsroom/NewsReleases/2009NewsReleases/6509externships.htm>

A research team led by Arunachalanadar Madakannan (Kannan), an engineering technology professor at Arizona State University, is studying PEM fuel cells with a focus on carbon nanotube-

based catalysts and electrodes. The approach allows for the use of less platinum, without impacting energy efficiency.

http://asunews.asu.edu/20090615_fuelcells

University of Georgia researchers have developed a successful way to grow molecular wire brushes that conduct electrical charges, a first step in developing biological fuel cells that could power pacemakers, cochlear implants and prosthetic limbs, the university announced June 22. The journal *Chemical Science* calls the technique “a significant breakthrough for nanotechnology.”

http://www.uga.edu/news/artman/publish/090622_biological_fuel_cells.shtml

Tennessee Tech University’s Cynthia Rice-York has earned a 2009 Ralph E. Powe Junior Faculty Enhancement Award from Oak Ridge Associated Universities. Rice-York will “quantify the impact of environmental factors — relative humidity, thermal gradient and others — on the mobility of water during freeze within [polymer electrolyte membrane] fuel cells.” Rice-York is an assistant professor in the Chemical Engineering Department.

http://www.tntech.edu/publicaffairs/rel/2009/june09/riceyork_powe.html

Keith Martin of Vancouver, who is specializing in mechatronics in the Engineering Physics co-op program at the University of British Columbia, received a \$2,500 scholarship from the BC Technology Industry Association. He was rewarded for his efforts during a previous work term with Ballard Power Corporation; Martin’s name was included on one of the company’s U.S. patent applications.

http://www.bctia.org/files/Whats_New_Files/2009_Scholarship_Winners_Press_Release_FINAL.pdf

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

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**About Fuel Cell Connection**  
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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/>)

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>)