PROGRAM facts

U.S. Department of Energy
Office of Fossil Energy
National Energy Technology Laboratory

Power Systems Advanced Research

09/2004

2004 Historically Black Colleges and Universities and Other Minority Institution (HBCU/OMI) Program Grants

Seven Minority Universities Win Fossil Research Grants to Advance Use of Coal, Oil, and Gas

Seven minority institutions will embark on another round of research and development projects now that the U.S. Department of Energy's Office of Fossil Energy has awarded grants through the Historically Black Colleges and Universities and Other Minority Institutions (HBCU/OMI) program. The projects will assist the nation in achieving its clean air and climate change goals and help boost declining oil supplies.

The HBCU/OMI research program grant gives minority students valuable hands-on experience in developing technologies to promote the efficient and environmentally safe use of coal, oil, and natural gas. The Office of Fossil Energy committed approximately $1 million to the HBCU program for 2004; the awards range from $20,000 to $200,000.

" These projects have a dual purpose—they offer some of our most outstanding current researchers and promising future scientists the opportunity to work together and solve problems that will assure the Nation a safe and enduring source of energy"

— Mark Maddox
Acting Secretary of Fossil Energy

The funding opportunity, announced in November 2003, offered financial assistance grants in eight technical topic areas. The seven awards have been made in five topic areas, three relating to coal, one each pertaining to oil and gas, and two affording faculty and students the opportunity to conduct exploratory research training as a team.

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Additional details can be found on the Department of Energy's fossil energy website at www.fe.doe.gov/techline/

The selected universities and their projects include the following:

Hampton University, Virginia—Researchers in the Department of Chemical Engineering will use a novel absorption process called phase-enhanced absorption to remove carbon dioxide from flue gas and other gas mixtures. The absorption process will be carried out in an absorber into which a liquid carrier (aqueous solution), an organic mixture (or organic compound), and a gas mixture containing a gas to be absorbed are introduced from an inlet. The carbon dioxide will be absorbed in the organic mixture and then removed, and the organic mixture will be reused.

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Tuskegee University, Alabama—Researchers in the Chemical Engineering Department are working with scientists at NETL and the Research Triangle Institute to develop a novel process for removing sulfur from coal gasification gas. In the process—called Single-step Sulfur Recovery Process (SSRP)—a catalyst will be used to convert hydrogen sulfide (H_2S) in coal gasification gas into elemental sulfur. The objective of the proposed research is to support the near- and long-term DOE efforts to commercialize the SSRP process.

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Morehouse College, Georgia—Biomass is composed of woody materials, and co-firing biomass and coal has been identified as a promising way of reducing net carbon dioxide emissions with minimum modifications in existing technologies. The shape and density for coal particles have been characterized and detailed data including surface area, volume, mass, and density distributions for several coal samples are now available for use in coal combustion models. Scientists in the Department of Physics and Dual Degree Engineering will be characterizing the shape, size and movement of biomass particles to provide detailed data similar to that available for coal.

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Prairie View A&M University, Texas—Researchers in the Department of Physics plan to use seismic stratification (sound waves) to identify rock layers, and ultimately, improve the ability to predict the location of oil for more productive drilling. Even with the use of current technology, drillers still hit dry holes. Prairie View A&M University proposes to work with the Exploration Geophysics Laboratory of the Bureau of Economic Geology, University of Texas at Austin, to produce case histories and seismic documentation. This preliminary data will be used by the oil industry to better prospect for oil. .

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Florida International University, Miami, Florida—Researchers in the Center for Energy and Technology for the Americas will be conducting research related to improving production in tight gas sand reservoirs. These resources are considered low-productivity reservoirs because they do not have an extensive interconnected network of natural fractures and usually require massive fracturing to achieve economic production. The researchers propose to study how microscopic flow mechanisms through tight sands affect production performance. They will use computer modeling to determine the properties of reservoir rock and the fluid it contains to predict the economical way to get gas from a tight reservoir.

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University of Texas at El Paso—Scientists in the Mechanical and Industrial Engineering Department will be helping meet DOE's Advanced Power Systems Turbine Program goals of developing very low emission turbine combustors which are capable of stable operation with fuel compositions ranging from natural gas to syngas. The researchers' primary objective is to develop a fundamental understanding of the flashback propensity of syngas at different compositions, with special interest in studying the effect of higher concentrations of hydrogen in syngas on flashback. Flashback occurs when combustion happens within the burner tube rather than outside, increasing emissions and causing serious damage to the hardware. .

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California State University, Los Angeles—Researchers in the Department of Chemistry and Biochemistry will explore the use of niobium (V) as a catalyst for efficiently converting small molecules derived from fossil fuels such as cyclopentadiene and alkenes to larger products that can be used in the pharmaceutical industry or by producers of fine chemicals. The project will provide students the opportunity to learn methods of handling air- and moisture-sensitive compounds.

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