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DOE Selects Historically Black, Hispanic Universities to Receive Federal Funds for Fossil Energy Research

As part of its efforts to encourage more participation by minority college students and teachers in its national energy program, the Department of Energy (DOE) has selected five coal, natural gas, and oil research projects to be carried out by student-teacher teams at Historically Black Colleges and Universities (HBCU) and Other Minority Institutes (OMI).

The 1998 winning schools are:

Tuskegee University, Tuskegee AL, for research on the rates of reaction of hot-gas desulfurization sorbents to be used in transport reactors;

The University of New Mexico, Albuquerque NM, for experimental and theoretical investigations to improve the thermal efficiency of current power plant power cycles;

North Carolina A&T State University, Greensboro NC, for development of novel electrocatalysts to advance the present state-of-the-art Proton Exchange Membrane fuel cells;

Prairie View A&M University, Prairie View TX, for research to improve steam flooding recovery processes for heavy oils;

Hampton University, Hampton VA, to research a novel method for converting sulfur dioxide from flue gas in coal utilization processes to marketable sulfur-based products, called sulphones.

In announcing the winning projects Secretary of Energy Federico Peña said, "this initiative will help solve national energy and environmental problems and provide for development of fossil energy related research infrastructure, and training and education for the students and faculty at participating organizations."

Each school will receive a federal research grant for the selected research to begin this fiscal year. Hampton University will receive about \$15,000 for a Faculty/Student Exploratory Grant to be carried out over twelve months. The other four winning schools will each receive Federal Core Research Grants of about \$200,000 for use over the next three years in carrying out the projects. This year's winners were selected from 19 proposals submitted to the Energy Department's Office of Fossil Energy as part of its Historically Black Colleges and Universities and Other Minority Institutions Research Program.

Secretary Peña said, "The initiative will help spur development of clean and efficient energy sources. The department wants to make full use of the Nation's academic talents in its energy programs. We're reaching out to the nation's science students to motivate our best minds to bring new ideas that address our nation's most critical energy needs. These grants support the educational promise for minority students while, at the same time, yielding solid research that can shape a cleaner, more secure energy future."

Now in its seventh year, the department's Fossil Energy Historically Black Colleges and Universities Research Program encourages teaching professors and students to carry out advanced research, in some cases in conjunction with private-sector companies. "This initiative guarantees that our next generation of scientists have grown through 'real life' research experience. In addition, historically black and minority institutions are able to maintain and expand their education, training, and research capabilities," said Patricia Fry Godley, DOE's Assistant Secretary for Fossil Energy.

More details on the winning projects follow:

Tuskegee University, Tuskegee, Alabama, will receive a \$199,969 grant for a three-year project to investigate the kinetics, or rates of reaction, of hot-gas desulfurization sorbents for transport reactors. The objective of this research is to conduct laboratory scale testing of at least three desulfurization sorbents to develop accurate kinetic rate equations for the sulfidation and regeneration of the sorbents. Such mathematical models of the process reactions will allow the desulfurization process developer to understand the chemistry relationships with the physical operation of their reactors. This will provide the rules for scaling of the process to larger plants. Including a cost share of \$42,000 by industrial collaborators, the total value of this project is \$241,969. The university will team with Research Triangle Institute, M. W. Kellogg, Phillips Petroleum Co., and United Catalysts Inc. Dr. Kyung C. Kwon will be the Principal Investigator.

The University of New Mexico, Albuquerque NM, will receive a \$199,048 grant for a three-year project for experimental and theoretical investigations of new power cycles and advanced falling film heat exchangers. The objective of this research is to analyze the effects on heat transfer of proposed additives in a falling film heat exchanger, thus addressing and reducing the irreversibility of heat exchangers to improve power plants' thermal efficiency. Students would perform experiments in a laboratory scale model and use thermodynamic analysis to optimize power plant efficiency. The Public Service Company of New Mexico will be the industry collaborator with the University of New Mexico on the proposed research. Dr. Arsalan Razani will be the Principal Investigator and Dr. Kwang J. Kim will be the Co-Principal Investigator on these studies.

North Carolina A&T State University, Greensboro, North Carolina, will receive \$199,999 for a three-year project to research novel electrocatalysts for Proton Exchange Membrane (PEM) fuel cells. Success could lead to lower cost, more flexible fuel cells, removing a major

commercialization hurdle. They will investigate the use of ruthenium and a transition metal to enhance the tolerance of the platinum used in PEM fuel cells to poisons associated with typical fuels. Ruthenium is known to increase carbon monoxide tolerance. Research Triangle Institute will collaborate on the investigation. Dr. Shamsuddin Ilias will be the Principal Investigator.

Prairie View A&M University, Prairie View, Texas, will receive a grant of \$199,518 for a three-year project to investigate improved steam flooding recovery processes for heavy oils. The Principal Investigator is proposing an interdisciplinary research program to quantify transport, Pressure- Volume- Temperature, and equilibria properties of selected oil/carbon dioxide/water mixtures at pressures and temperatures typical of steam injection processes for thermal recovery of heavy oils. This research team seeks to advance the theory and computational accuracy for these mixtures. BDM Petroleum Technologies will collaborate with the University on the project. Dr. Jorge Gabitto will be the Principal Investigator on the project.

Hampton University, Hampton, Virginia, will receive a Faculty/Student Exploratory Grant of \$14,992 for a one-year project to research a novel method of converting sulfur dioxide (SO₂) from flue gas in coal utilization processes to marketable sulfur-based products, called sulfones. The Principal Investigator is planning to use low-cost organic compounds such as benzoyl peroxide and diphenylmethane for this research. The resulting sulphones are said to have potential commercial applications in other industrial processes. Dr. Shuming Zheng will be the Principal Investigator for this Faculty/Student Exploratory Grant.