MISSISSIPPI DOE EPSCoR
PLANNING GRANT

Final Report

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MISSISSIPPI DOE EPSCoR PLANNING GRANT FINAL REPORT

ABSTRACT

The Mississippi DOE EPSCoR planning grant committee identified three focus areas for a proposal submitted on January 25, 1995, to the U.S. DOE: Human Resource Development, Environmental Synergisms from Fuel Mixtures of Tire Particles and Low Rank Coals, and Energy Efficient Heat Transfer Equipment and Materials. In the human resources area, efforts were undertaken to identify and develop linkages with educational institutions, national laboratories, and industries and to identify strategies for attracting and involving students in areas leading to technical careers. The fuel mixtures project was directed toward developing ways to combine scrap tire particles and lignite coal into a blended fuel that could be used in electric power generation. In the energy efficient heat transfer area, analytical and experimental investigations were planned to increase the efficiency of heat exchangers and insulating materials.

INTRODUCTION

The DOE planning grant funding to the State of Mississippi for the preparation of a proposal for the Experimental Program to Stimulate Competitive Research (EPSCoR) has provided the opportunity for the development of a statewide, coordinated approach toward energy research and human resource development. Mississippi's four largest institutions of higher learning, Mississippi State University (MSU), Jackson State University (JSU), the University of Mississippi (UM), and the

University of Southern Mississippi (USM), are working together to identify research expertise and potentially competitive research areas. They are also working to develop the infrastructure for greater cooperation among the faculty from all universities in the state and for increased participation of students in energy related projects.

The EPSCoR activities are managed by the Mississippi Research Consortium (MRC). The chief research officers of the four participating universities constitute both the Board of the Consortium and the EPSCoR Executive Committee. The planning committee for the DOE EPSCoR proposal is composed of Dr. Glenn Steele (MSU), proposal coordinator, Dr. George Adebisi (MSU), human resources director, and the following representative from the four MRC universities: Drs. Robert Cook and Robert Taylor (MSU), Drs. Raz Pandey and David Wertz (USM), Drs. Jeffrey Roux and Peter Sukanek (UM), and Drs. Xijian Liu and Ken Lee (JSU). The organizational structure of the Mississippi DOE EPSCoR program is given in Figure 1.

PLANNING COMMITTEE ACTIVITIES

The calendar of activities of the Mississippi DOE EPSCoR planning committee is given in Figure 2.

The research clusters proposed for the Mississippi DOE/EPSCoR Program were the result of a three-year review and selection process. In 1991, Mississippi

Figure 1. MISSISSIPPI DOE/EPSCoR ORGANIZATION

Figure 2. Calendar of Activities of the Mississippi DOE EPSCoR Planning Committee for the 1994-1995 Project Year

August 1994	Proposal revision started
September- October 1994	Planning grant committee coordinating meetings
November 1994	First draft of revised proposal completed
December 1994	Final draft of revised proposal completed
January 1995	Completed proposal submitted to DOE
August 1995	Response received from DOE

received a planning grant from the DOE to initiate the EPSCoR program. Through an extensive process of proposal solicitation and review followed by interaction with the interested faculty, the Planning Grant Committee developed a proposal for the first round of DOE/EPSCoR competition. The Mississippi DOE/EPSCoR Committee benefited significantly from the review comments received on the proposal submitted. These comments were used to refine the two strongest clusters into research programs that had the potential to become nationally competitive. These two clusters along with the human resources component were prepared for the second round of DOE/EPSCoR competition. The comments received in this round were used to further refine the research areas into two stronger research clusters. These two clusters each had participants from the four state comprehensive universities and combined the talents and expertise of scientists, mathematicians, and engineers.

Each cluster chose Advisory Committee representatives from industrial and national laboratories to provide guidance in the proposal preparation. Each cluster's technical proposal was submitted to the appropriate advisory committee members for advice and comments. These comments were incorporated into the final version of the proposal.

Summaries of the proposed research clusters are given below:

(1) Energy Efficient Heat Transfer Equipment and Materials

The research in the Energy Efficient Heat Transfer Equipment and Materials cluster was directed toward increases in energy conservation through two projects - improved heat exchanger design and the development of customized insulations for

hot, humid climates. Heat exchangers are used in all air conditioning and refrigeration equipment, and improvements in their performance would lead to major savings in energy and dollars. This project had close ties with Heatcraft, Inc., a Mississippi manufacturer that is a major national supplier of heat exchangers. The second project in this cluster was to work on the development of new, smart building insulation materials for warm southern coastal climates that would take advantage of the water in the air to reduce the heat transfer into the living spaces during the summer months. The impact was to be reduced air conditioning demand which would yield significant energy savings.

(2) Environmental Synergisms from Fuel Mixtures of Tire Particles and Low Rank Coals

The Fuel Mixtures of the Particles and Low Rank Coals cluster had six projects which would combine the expertise of physicists, chemists, and chemical engineers to address a problem of significant importance to the state and the nation. Waste tires represent both a significant environmental problem and a major energy resource. In addition, Mississippi has an abundance of low rank lignite coal. This research cluster was to be directed toward developing ways to combine scrap tire particles and lignite coal into a blended fuel that could be used in electric power generation. The impact was to be an improvement in the environmental problems caused by disposing of used tires in land fills and the expansion of the market for Mississippi lignite coal.

The human resources development portion of the Mississippi DOE/EPSCoR program addressed the state's objective of strengthening the scientific community by adding to and working with other established programs to expand the human resource pool which is involved in energy-related research and education. Several initiatives are already in place in Mississippi to increase the pipeline for careers in science and engineering, and the DOE/EPSCoR human resources program was to mesh with and complement these programs to increase the numbers of under represented minorities, women, and disabled individuals in energy-related science, engineering, and mathematics research and education.

Mississippi is in a unique position to have a significant impact on the numbers of African Americans involved in energy-related activities. The majority of the human resources funds for DOE/EPSCoR were to be used to incorporate into the research cluster activities in the summer teachers and students from the Mississippi public school system and junior faculty and students from the state's HBCU's. During the academic year there would have been followup activities between the human resources individuals and the research cluster PI's including visits by the PI's to the schools and HBCU campuses. These efforts when combined with interactions with other state initiatives and with the junior faculty, undergraduate student, and graduate student development funded directly in the research clusters would have comprised the complete human resources development program. The primary objective was to reach and have an impact on as many individuals as possible.

CONCLUSION

The Mississippi Research Consortium, the planning grant committee, and the research area leaders prepared a proposal to the U.S. DOE for the EPSCoR program. The research focus areas were identified and budgets were prepared for the projected work in each area. The proposal was submitted to the U.S. DOE on January 25, 1995. On August 3, 1995, the Mississippi group was informed that their proposal was not funded.