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PROJECT FACTS

UNIVERSITY OF KENTUCKY
CENTER FOR APPLIED ENERGY RESEARCH

Resolution of the Technical Obstacles Impeding Commercial Production of Briquetted Fuels from Coal and Biomass Wastes

PARTICIPANTS

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Project Value

KOEP $100,000

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Despite advantages of sustainability, low emissions of SO_x, NO_x, and mercury, and neutrality with respect to CO_2 emissions, biopower accounts for less than 1% of the electricity generated in the US. This low rate of utilization is due to a low energy density, making transport expensive, as well as to the significant capital investment needed to utilize biomass directly for power generation. Co-firing biomass with cleaned waste coal is a practical and economical way to generate electric power from biomass at a significant scale. Similar to biomass, utilization of fine waste coal is hindered by obstacles associated with handling, storage, and transportation that stem mostly from a high and expensive-to-remove moisture content. Manufacturing a high-quality briquetted fuel from coal and timber waste can improve the marketability of both materials by providing a reduced-moisture product that can be transported as dense, free-flowing solids and then stored, crushed, and conveyed in existing equipment.

Prior work at the UK CAER demonstrated that high-quality briquettes can be produced from a combination of sawdust and fine waste coal at an estimated cost of $17/ton. While the investigation demonstrated that coal and timber wastes can be economically converted into a premium fuel, the study failed to resolve a major technical obstacle. Namely, that due to poor flow properties, the fine coal/sawdust blends could not be uniformly fed to a continuous briquetter, resulting in frequent run stoppages. Accordingly, this project focuses on resolving this major impediment to commercial production of fine coal/biomass briquettes. A secondary objective will be to evaluate three abundant waste materials as briquette binding agents (e.g., sewage sludge, poultry litter, and soybean-processing wastes). It is anticipated that the successful completion of this project can spur the development of an in-state industry that addresses all three of the guiding principles used in the development of Kentucky's energy policy: lower-cost energy via production of a high-quality, low-cost fuel; responsible and beneficial utilization of energy resources now being discarded; and a commitment to the environment through production of a fuel that burns cleaner and simultaneously reduces the amount of waste material being discarded.

Briquetting Video