

# PROJECT FACTS

UNIVERSITY OF KENTUCKY CENTER FOR APPLIED ENERGY RESEARCH

## PARTICIPANTS

UK Center for Applied Energy Research  
2540 Research Park Drive  
Lexington, KY 40511

## SPONSORS

DEDI

## CONTACT

Darrell Taulbee  
UK CAER  
2540 Research Park Dr.  
Lexington, KY 40511  
859-257-0238  
[taulbee@caer.uky.edu](mailto:taulbee@caer.uky.edu)



## POWER GENERATION & UTILITY FUELS

### Co-briquetting of Biomass and Fine Coal

Despite advantages of sustainability, low emissions of  $\text{SO}_x$ ,  $\text{NO}_2$ , and mercury, and lowered  $\text{CO}_2$  emissions, biopower accounts for less than 1% of the electricity generated in the U.S. This rate is due to low energy density, making transport expensive, as well as to the significant capital investment needed to use biomass directly for power generation. Co-firing biomass with cleaned waste coal is a practical and economical way to generate heat or electric power from biomass at a significant scale. Like biomass, use of fine waste coal is hindered by obstacles associated with handling, storage, and transportation that mostly stem from high and expensive-to-remove moisture content. Manufacturing briquetted fuel from coal and biomass 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 and conveyed in existing equipment.

Early projects in collaboration with the UK Department of Mining Engineering revealed that high-moisture coal fines that have been or continue to be discarded can be cleaned and co-briquetted with biomass to produce a high-quality, premium fuel. An economic assessment indicated that biomass-coal briquettes can be produced for as little as \$17/ton when the briquetting plant is integrated with a coal-cleaning operation. Subsequent combustion tests in an industrial furnace demonstrated that biomass-coal briquettes exhibit acceptable handling and combustion characteristics while providing substantial reductions in flue-gas emissions of  $\text{SO}_2$  and  $\text{NO}_x$ . More recent research has focused on addressing obstacles associated with poor flow characteristics of wet, fine coal wastes as well as the high costs and safety concerns associated with drying of those materials.



Biomass-Coal Briquettes



Combustion of Briquetted Fuels