

# 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

KOEP (Kentucky Office of Energy Policy)

KREC (Kentucky Rural Energy Consortium)

## PROJECT VALUE

KREC-\$125,759  
KOEP-\$35,698

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## POWER GENERATION & UTILITY FUELS

### Production of Biomass Briquettes as an Alternative Fuel Source

The numerous industrial and process heat boilers found at pulp mills, food plants, and other industrial sites around Kentucky are relatively small, often less than 25 MW units, which are essentially unregulated. As such, they tend to have lower efficiencies and higher emissions-per-Btu relative to larger coal-fired utility boilers that must comply with increasingly stringent environmental regulations. Considering that natural gas and coal are often the primary fuels used in these units, the substitution of CO<sub>2</sub>-neutral biomass represents an attractive approach to decreasing the release of air pollutants such as SO<sub>x</sub>, NO<sub>x</sub>, and mercury as well as reducing fossil energy consumption in this often overlooked, but significant industrial sector. One promising approach is to substitute a briquetted fuel manufactured from the agricultural or wood waste that is generated at or near the industrial site where the fuel is to be used. In addition to being sustainable and cleaner burning, such a briquetted bio-fuel can be more economically stored, conveyed, and processed in existing equipment. Further, the development of low-cost, briquetting binders from agricultural-processing residues would create a market for these low-value by-products while decreasing the energy required for the briquetting process.

Accordingly, the overall goal of the project is to produce a premium, durable briquetted biomass fuel from agricultural and wood wastes that is an attractive alternative energy source for coal-fired boilers and which could potentially be utilized in residential applications. Specific objectives include:

1. Investigate corn stover, fescue, and wood waste as a briquetted-fuel source,
2. Assess the performance of inexpensive binders available from farms and agricultural-processing facilities (e.g., poultry litter, gum residue from soybean oil extraction, and distillers grain from ethanol production),
3. Determine the energy content, chemical composition, and strength and attrition characteristics of the biomass briquettes produced,
4. Estimate the economics and net energy balance for briquetted biomass fuels.