WOOD to ENERGY

Case Study

Burning Sawdust for Heat and Power

Lindsey McConnell & Martha C. Monroe

Forests cover more than 65 percent of the state of Virginia, so it's no surprise that the forest products industry is the state's number one employer. Located in the center of the state, and dubbed the heart of Virginia, is Prince Edward County. The county seat, Farmville, is home to Longwood University, where more than 4,000 students attend school.

The school first experimented with using wood for energy in 1983, after the Southern Railroad line that delivered coal to the area was removed. Longwood wanted a fuel source that offered a number of economic and environmental advantages. Meanwhile, local logging operations needed a way to dispose of their sawdust, wood chips, and other wood waste. The university agreed to purchase the waste wood for energy production and converted two coal boilers to run on wood. The school initially burned all types of wood waste but now uses only sawdust from pines and hardwoods to heat the campus. David Dunman, utility plant specialist, says sawdust is cheaper to purchase and transport than other wood wastes, and he has found that burning one type of sawdust or a thorough mix burns most efficiently (Figure 1). Dunman estimates the Longwood facility uses around forty-two tons of sawdust each day, and pays suppliers between $13 and $18 per ton for fuel.

The facility owns a truck and three trailers for transporting the biomass from local sawmills within a fifty-mile radius to their four-acre storage area just outside of town. Each of the trailers is placed at a different lumber yard, and when a filled trailer is picked up, it is replaced with an empty one. Additional contract haulers are sometimes hired if the truck needs maintenance or there is a need to move sawdust quickly. The off-site storage also helps keep most of the truck traffic off campus roads. Because many local sawmills shut down when outdoor temperatures are low, this stored supply enables the Longwood facility to continue to operate. However, when temperatures drop below thirty degrees, the facility switches to a combination of sawdust and oil due to the limitations of the sawdust burning boiler capacity.

Each day during the winter season, about three trailers of sawdust are delivered from storage to the plant and burned in a Hurst hybrid boiler. A computer regulates the sawdust and the combustion air to the boiler, which operates at 1,500 degrees Fahrenheit in the furnace. The boiler supplies 90 percent of the heat and hot water used in the residence halls and other school buildings.

Figure 1. *Sawdust can be easier and cheaper to purchase and transport than other wood wastes.* Photo courtesy of East Tennessee Clean Fuels.

Dunman admits there have been challenges in using the computer system at times.

In general, the university community has been pleased with their wood-to-energy program and are planning the construction of a larger facility that will have three wood boilers. The school leaders plan to produce all of their heat and hot water from wood within two years. They plan to make improvements to storage and hauling as they move forward with plans for the new plant.

For more information regarding specific concerns about wood-to-energy facilities, refer to the other fact sheets, case studies, and community economic profiles available in this series at http://www.interfacesouth.org/woodybiomass. Additional information is available at http://www.forestbioenergy.net.

Authors

Lindsey McConnell, Outreach Assistant, and Martha C. Monroe, Associate Professor, School of Forest Resources and Conservation, University of Florida, Gainesville, FL.

Reviewers

Tommy England, Trades Manager, Longwood University Heating Facility, Farmville, VA, and Phillip Badger, Bioenergy Technical Director, Southern States Energy Board, Florence, AL.

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