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PROJECT SUMMARY

Biomass District Thermal Energy Project

Southern Reynolds Schools, Ellington Campus, Reynolds County, Missouri

The Missouri Department of Conservation is providing grant funding to six schools in Missouri for implementation of biomass thermal energy projects. The funding is provided under the Recovery Act (ARRA), and is administered by the US Forest Service. The Wood Education and Resource Center (WERC) is providing technical assistance to MDC for project evaluation and implementation. The project description and statistics provided in this summary are based on the initial investigations performed by WERC. The final project configuration may include changes based on the final design.

Project Description

Existing System – There are three buildings at the Southern Reynolds campus that are within the scope of the biomass project. The largest building (Middle/High School) has two centralized propane boilers providing the majority of the heating needs. The new portion of the Elementary School is heated by distributed heat pumps supplemented by electric resistance coils. The third building is the smaller wood shop building that has an old central heating system.

Proposed Biomass System – The project consists of installing a central advanced biomass combustion unit utilizing wood chips as a fuel to supply 85% of the heat for the three buildings. Hot water will be piped to the existing central distribution systems within the Middle/High School and wood shop buildings. A new central hydronic distribution system will be required in the new Elementary building to allow tie-in by the biomass system. The biomass unit will be approximately 1.0 mmBtu/hr, and will utilize thermal storage to improve overall system efficiency. The biomass unit meets stringent European emission requirements, and has a combustion efficiency of about 95%.

Key Project Statistics

Existing system

- School square footage – 91,000 ft²
- Current fuel(s) used for heating – Propane, electric
- Annual fuel cost – \$46,000

Proposed system

- Annual wood utilization – 225 tons wood chips
- Projected annual fuel cost – \$16,000
- Grant funding provided – \$970,000

Projected annual fuel cost savings – \$30,000