

Annual Biomass Project Performance Report Narrative

Eureka Public Schools

2008

The Eureka Biomass Plant was commissioned in December of 2007, and went into full operation January of 2008. The Project involved several subcontractors as well as a general contractor with a work force of well over 20 people for six months. While Job creation or retention was not the primary focus of this project, the project payroll was significant and impacted the local economy for that six month period.

Our primary goal for this project was energy cost savings for the Eureka School District, and while the savings experienced were not on the order that was anticipated, they were significant. We received 30 loads of wood fuel during the 2008 calendar year of an average of 20 tons each. Each load represents five to six days of heating, for a total of 150 heating days. Our wood fuel cost was approximately (depending on delivery costs) \$ 45.00 per ton, making the total cost to heat those 150 days \$27,000.00. Contrasting that with projected fuel oil usage and costs of \$262,500.00, (Average 500 gals/day, average costs \$3.50/ gal) we avoided spending a total of approximately \$ 238,500.00 for heat during 2008 heating season. This is more accurately expressed as a cost avoided as opposed to a savings as that dollar amount was never in the budget projections, and our conventional fuel usage was up, compared to projections, due to mechanical and fuel issues with the wood fired plant.

Fuel quality was our number one issue this heating year. Our hope was to be able to use hog fuel from logging slash for our only fuel source, and while we are able to run this material the amount of down time associated with this fuel type has seriously hindered our ability to provide 90% of our heat load from wood.

There are direct costs associated with hog fuel from slash, in that the amount of non-combustible material included in the fuel must be removed. Since this material holds a lot of heat it must be cooled before removal, resulting in extended down time cycles, just to clear the grates for complete combustion. This down time results in greater use of the conventional fuel boilers and a resulting higher fuel cost. Until the material can be sorted and cleaned in a manner that eliminates the dirt, rocks, and excess needles/ bark, it will be very difficult to run efficiently without automatic ash and clinker removal.

There are also indirect costs associated with poorer quality fuels. The increased wear from the dirt in the hog fuels have caused premature failures in most of the material handling equipment. We are replacing equipment that should have lasted for more than five years in a little over one. We have also experienced more than normal down time to remove dirt and rocks from drains and pumps in the boiler room, as well as electrical failures in micro switches due to excessive levels of very fine dust. We have replaced metering auger motors, bearings, and equipment, drive drums, chain drives, switches and breakers, all because of excess strain caused by the dirt and rocks in hog fuels.

When we were able to get clean chipped fuel we ran with very little trouble, minimal ash, and almost no down time. We were able to achieve the 90% heat from biomass that was our original goal. This fuel however is hard to get in our area, we have been able to get only three 20 ton loads, as local mills are being phased out or shut down for economic reasons. Our fuel supplier has purchased a whole tree chipper and is trying to provide us with clean chips from the logging slash to meet our original supply goals. Once this chipper is online we should see an increase in our efficiency and a decrease in our down time.

Our secondary goal was one that related to quality of life. For every 20 tons load of wood fuel we burned we avoided using 3,000 gallons of heating oil. As the wood fuel we consumed was to be burned as slash, our wood fuel is considered Carbon Neutral. There are 22.384 pounds of CO₂ per gallon of heating oil (diesel fuel). We multiply 22.384 by the number of gallons of heating oil consumed annually and divide by 2,205 to get metric tons of CO₂ per year. We avoided 761.4 metric tons of carbon dioxide emission for the 2008 heating year, and burned the slash in a manner that improved the air quality while still supplying heat to our schools.

Our overall objectives for this project have, for the most part, been met. Although we have not as yet experienced the total cost saving expected, we believe that we are on track to accomplishing the total savings goal once we have solved the fuel quality issues of our wood fuel. Our supplier is committed to providing us with a fuel that meets the quality required to limit down time of the heating plant while still achieving the desired goal of using logging slash as the wood source. Once that has been achieved our down time and maintenance cost will drop as well as the backup fuel oil cost associated with having to fire our other boilers. We will then be able to put that savings back into our School budget, first to pay for the cost of building the plant, then for educational costs rather than heat.

We as a district remain committed to the belief that biomass fuels are a viable alternative to fossil fuels for heating our schools, and is an environmentally sound choice. We feel that we are on track to accomplish the overreaching goal of providing heat without compromising air quality, while still providing a market for forest products that would otherwise go unused.

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