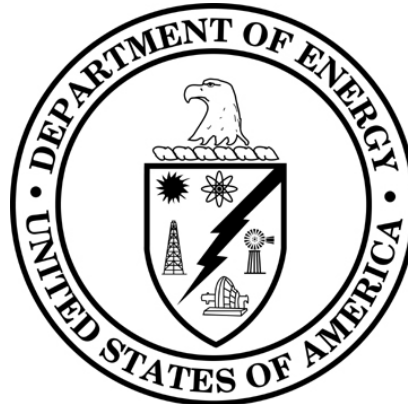
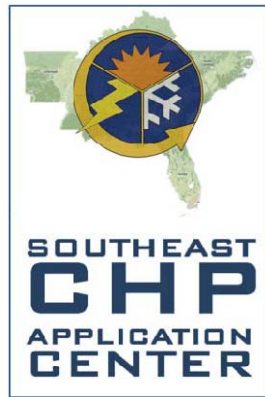


Homan Lumber Company (Fulton, MS) Clean Heat and Power System



Project Profile

Project Overview:

Homan Industries has met with representatives the Southeast CHP Application Center (Southeast RAC) to discuss the possibility of utilizing excess wood waste as fuel for a Clean Heat and Power application that would provide electricity and process heat for the Homan Industries facility. The Southeast RAC has analyzed the Homan Industries facility and evaluated the technical and economic feasibility of a CHP application as well as assessed the impact that an opportunity fuel, such as the excess wood waste, would have on the project that may otherwise have been economically marginal. The report examined the use of three CHP technologies: 1) a wood-fired steam boiler with a condensing turbine, 2) a wood-fired steam boiler with an extraction turbine, and 3) a wood-fired steam boiler with a backpressure turbine. The systems were selected based primarily on their ability to provide the lumber mill's process heat requirements of approximately 22,500 pounds of steam per hour. In addition to meeting the facility's heat requirements, the systems would provide electrical power which could be sold back to the local utility under the Tennessee Valley Authority's Green Power Switch Generation Partners program.

Homan Industries:



The following tables illustrates the biomass fuel sources that are currently available at Homan Industries and the financial opportunities associated with each fuel source as well as a cost comparison between CHP options considered:

Fuel Source	Tons/yr	Moisture Content	Current Value (\$/ton)	Current Value (\$)
Chips	103,000	50%	\$30.00	\$3,090,000
Bark	8,400	50%	\$14.00	\$117,600
Dry Shavings	9,600	25%	\$26.00	\$249,600
Green Sawdust	12,000	50%	\$14.00	\$168,000

Option	Implementation Cost	Simple Payback	Internal Rate of Return	Net Present Value	Power Generated
Condensing Steam Turbine	\$2.9 M	2.3 years	43%	\$4.2 M	1-MW
Extraction Steam Turbine	\$5.3 M	9.7 years	8%	\$590 K	1-MW
Backpressure Steam Turbine	\$2.1 M	3.5 years	29%	\$1.8 M	700-kW
Large-Scale Condensing Steam Turbine	\$57.5 M	>10 years	4%	Negative	23-MW

The report concluded that, of the technologies studied, a condensing turbine system has the greatest potential for success at Homan Industries. The economic analysis performed on the condensing turbine CHP system is as follows:

Production Tax Credit		Investment Tax Credit	
Revenue Stream	Value	Revenue Stream	Value
Annual Energy Sold	\$882,237	Annual Energy Sold	\$882,237
Annual Production Tax Credit	\$147,168	Annual Carbon Emissions Credit	\$0
Annual Carbon Emissions Credit	\$0	Annual "Lost Sale" of Biomass	(\$272,471)
Annual "Lost Sale" of Biomass	(272,471)	Annual Station Load Costs	(\$53,368)
Annual Station Load Costs	(53,368)	Annual Maintenance Costs	(\$56,064)
Annual Maintenance Costs	(56,064)	Total Annual Savings	\$500,334
Total Annual Savings	\$647,502	One-time Cash Flows	
One-time Cash Flows		Installation Cost	(\$2,900,000)
Installation Cost	(\$2,900,000)	Investment Tax Credit (Grant)	\$870,000
Depreciation Tax Savings	\$862,750	Depreciation Tax Savings	\$862,750
TVA GPS One-Time Incentive	\$1,000	TVA GPS One-Time Incentive	\$1,000
Total Investment	(\$2,036,250)	Total Investment	(\$1,166,250)
Simple Payback (years)	3.1	Simple Payback (years)	2.3
Fuel Source	Current Value (\$/ton)	Value as Electricity (\$/ton)	Lost Value (\$/ton)
Chips	\$30.00	\$45.33	\$15.33
Bark	\$14.00	\$45.33	\$31.33
Sawdust/Fines	\$14.00	\$45.33	\$31.33

The system could produce 1 megawatt (MW) of electrical demand and generate 7 million kilowatt-hours of electricity per year. With TVA's incentives and the Federal renewable energy tax incentives, the payback period for the 1-MW condensing steam turbine system operating continuously is approximately 2.3 years. The project has a net present value of \$4.2 million with an internal rate of return of 43%. This preliminary assessment indicates an excellent opportunity for a CHP system at Homan Industries. In most cases, Homan Industries receives less money for its wood waste than it would receive by burning the wood waste in a CHP system.