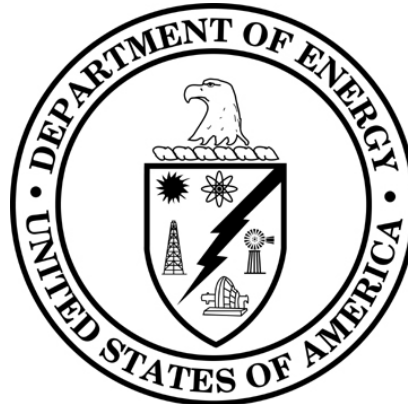
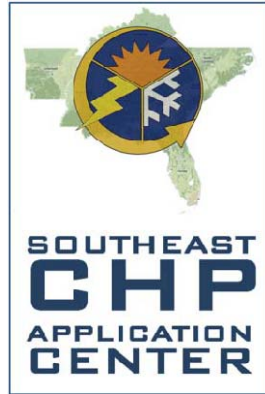


## McShan Lumber Company (McShan, AL) Clean Heat and Power System



### Project Profile

#### Project Overview:

Representatives of the Southeast CHP Regional Application Center (Southeast RAC) as well as representatives from Alabama Power met with representatives from McShan Lumber Company in McShan, AL to discuss the possibility of utilizing excess wood waste as fuel for a Clean Heat and Power (also known as Combined Heat and Power, CHP) application that would provide electricity and process heat for the McShan Lumber facility. As part of the Southeast RAC technical assistance and outreach program, the Southeast RAC agreed to analyze the McShan Lumber facility and evaluate the technical and economic feasibility of a CHP application. The study also 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. Additionally, the study determined what incentives, if any, would be necessary to make CHP economically viable.

#### CHP Project:

The feasibility study performed by the Southeast RAC examined the use of three CHP technologies: 1) a wood-fired steam boiler with a backpressure turbine, 2) a wood-fired steam boiler with a condensing turbine, and 3) a wood-fired steam boiler with an extraction turbine. These systems were investigated due to their ability to provide the lumber mill's process heat requirements of approximately 15,000 pounds of steam per hour. In addition to meeting the facility's heat requirements, the systems would provide electricity for the facility's electrical requirements of 5.8 Million kWh per year.

**McShan Lumber Facility:**



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:

<b>Fuel Source</b>	<b>Tons/yr</b>	<b>Moisture Content</b>	<b>Current Value (\$/ton)</b>	<b>Current Value (\$)</b>
Chips	32,491	50%	\$25.27	\$821,048
Bark	8,841	58%	\$7.61	\$67,280
Dry Shavings	5,095	15%	\$30.27	\$154,226
Green Sawdust	18,000	58%	\$0.00	\$0

The report concluded that, of the technologies studied, a Condensing Steam Turbine system (option 2) had the greatest potential for success at McShan Lumber. The economic analysis performed on the Condensing Turbine CHP system is as follows:

Revenue Stream	Value	Fuel Source	Value as Electricity (\$/ton)
Annual Energy Cost Savings	\$351,695	Chips	\$22.95
Annual Demand Cost Savings	\$97,024	Bark	\$19.28
Annual Energy Sold	\$780,964	Dry Shavings	\$39.02
Annual Production Tax Credit	\$242,967	Green Sawdust	\$19.28
Annual Carbon Emissions Credit	\$8,964		
Annual "Lost Sale" of Biomass	(\$1,019,190)		
Annual Maintenance Costs	(\$69,379)	<b>Fuel Source</b>	<b>Lost Value (\$/ton)</b>
Total Annual Savings	\$393,045	Chips	(\$2.32)
		Bark	\$11.67
<b>One-time Cash Flows</b>		Dry Shavings	\$8.75
Installation Cost	(\$5,500,000)		
Depreciation Tax Savings	\$1,636,250		
Total Investment	(\$3,863,750)		
<b>Simple Payback (w/PTC)</b>	<b>9.8 years</b>		

This system has the capacity to produce 2.2 megawatts of electrical demand and generate 17 million kilowatt-hours of electricity per year with a payback of 9.8 years, \$1,773,000 annual positive cash flow, and internal rate of return of 2.33%. Therefore, the preliminary assessment indicated a marginal opportunity for a CHP system at McShan Lumber. In most cases, McShan Lumber currently receives more money for its wood waste than it would save utilizing the wood as a CHP system fuel.