



GEORGIA FORESTRY INDUSTRY



Identify the Numbers

The state of Georgia currently ranks third in the United States and first in the southeast in total forest land area. For this reason, Georgia's forestry industry was chosen for a CHP market analysis. Forestry, a \$25 billion dollar a year industry in the state of Georgia, is currently the leading industry in the state, making timber its most highly valued crop. Forestry industries account for 24% of total manufacturing output in the state.

The state of Georgia contains the largest area of forest in the south with 67% of the state being covered by forests. Of that, 98% is considered timberland or suitable for timber production by the Georgia Forestry Commission. Forestry and forest products currently account for 24% of all manufacturing in the state. Energy costs account for approximately 3% of the value of finished goods in the forestry industry. At a national level, the forestry industry consumes 3.3 quadrillion BTU's of energy per year to make its products.

Why is this market sector a good fit for CHP?

The Georgia forestry industry is a large, energy intensive, multi-billion dollar business that accounts for the employment of a significant portion of working Georgians. Nationwide, the industry consumes over 3 quadrillion btus of energy/yr. This number is despite the fact that CHP has been in use in the forestry industry for over seventy-five years. Chemicals are re-used and heat is recaptured to produce steam for electricity production in most mills in Georgia. Approximately 3% of the value of finished products are associated with energy usage in the forestry industry. This number is twice that of similar manufacturing industries. The fact that the forestry industry is regarded as such an energy-intensive industry has prompted a market assessment of CHP in the Georgia forestry industry.

What is the market potential for this sector?

Recently, the pulp and paper industry has begun facing plant closures and downsizing due to the slowing economy and its effect on demand for paper products. This is having a very negative effect on many communities across the country. As a result, the forestry industry has escalated its interest in forest biomass as an energy fuel. Forest biomass is organic material that includes trees, brush and residue from wood manufacturing facilities. The Georgia Forestry Commission estimates that Georgia's waste wood, such as brush, ground waste, and unusable timber, has the potential to supply as much as 22% of Georgia's energy needs. One option being explored to revitalize the industry is transforming pulp and

paper mills into bio-refineries, factories where alternative fuels can be produced. Two years ago, Georgia forest landowners and energy companies began discussions on how to increase development in this arena. These mills can be fully transformed or modified into a pulp and paper/energy hybrid. Since transforming a mill into a full-scale bio-refinery can be extremely cost-prohibitive, with costs ranging anywhere from \$50 million to several hundred million dollars, hybrid refineries may be the direction the industry is headed.

Content Comparison		
Biomass	5300-6400	BTU/lbm
Coal	7000-12,500	BTU/lbm
Biomass Gas	150-800	BTU/ft ³
Natural Gas	1000	BTU/ft ³

(Christiansen, Ryan. "The Next Hot

Dec. 2008. Rpt. in. Grand Forks, ND: BBI International, 2008.)

Commodity." [Biomass Magazine](#)

What are the benefits and actual behaviors observed?

Georgia legislators have seemingly recognized a statewide trend. Last year, the state government passed a bill that would entitle business owners and residential customers to income tax credits if certain clean energy property criteria were met. The bill approves tax credits of up to \$2.5 million through 2012 and applies to clean energy property including, but not limited to, "biomass equipment to convert wood residuals into electricity through gasification."

Opportunities for CHP installations do exist in many mills where potential energy sources are often ignored or discarded. The largest barrier towards the implantation of CHP in the industry is the high implementation costs associated with purchasing the equipment necessary to take advantage of the available biomass fuel sources such as wood residue, waste wood, construction and demolition waste and black liquor. For example, a gasifier, which would be required to implement the most efficient use of biomass fuels, can alone cost \$3000/kW. These initial costs make it difficult for some to see the longer-term savings and benefits of CHP applications using frequently discarded biomass fuel.

Some industry leaders, however, such as Georgia Power, are moving forward with plans to utilize renewable wood biomass. They believe that the lower fuel and operating costs associated with woody biomass, outweigh the initial conversion costs of the project. Biomass fuels that would normally go to waste are typically less expensive to obtain and usage provides tax credit in many states, including Georgia.

Gasifiers		
Modify Existing Equipment	\$600-\$1000	per kW
Installed Cost (New)	\$1130-\$3130	per kW
Maintenance	\$0.005-\$0.021	per kWh
After treatment Cost	\$500	per kW
Statistics taken from <u>Combined Heat and Power Market Potential for Opportunity Fuels</u> . Aug. 2004.		

Use/Examples/Obstacles

Last August, Georgia-based Georgia Power requested approval from the state to turn one of its coal burning plants, Plant Mitchell, near Albany, currently capable of producing 155MW/year to 100% wood power. The wood waste will be obtained from suppliers operating within a 100-mile radius of the plant and power over 60,000 homes. In September, Oglethorpe Power Corp. announced its intention to build three 100MW/year power plants by 2015 powered by chipped pulpwood, sawmill waste, and harvest residue.

A study published by the U.S. Department of Energy’s National Renewable Energy Laboratory, stated that biomass energy plants create up to 4.9 jobs for each MW of installed capacity – that’s nearly 1,500 new jobs if all three of Oglethorpe’s proposed biomass plants are developed. Each plant will provide up to 40 new full-time jobs on-site as well as employ hundreds more in the state’s forestry industry, through jobs associated with harvesting, processing and delivering biomass for the plants.

Additional Benefits

While the forestry industry already engages in many forms of CHP, these are mostly applications that produce heat, steam or provide electricity for the specific facilities themselves. This assessment attempts to evaluate the current CHP efforts in the industry as well as determine opportunities for CHP in unexplored areas that may serve to lower costs and/or increase energy efficiency for the forestry industry in the state of Georgia.

While CHP may provide a cost-saving, energy-efficient option for the forestry industry, change is slow to come due to the capital and energy-intensive nature of the industry. However, the availability of biomass in the industry at a relatively low cost is something that will not be ignored much longer.

CHP implementation, is a cost-based decision that will more than likely coincide with government incentives, rising fuel costs or industry-wide adoption of hybrid mills which manufacture goods and produce electricity. The rest of the industry will be forced to follow suit in order to compete.

For interested parties, CHP technologies offer a potential opportunity to increase productivity and economic efficiency within the agricultural process. As such, there are numerous government, trade, and support organizations for the implementation of CHP equipment.

The Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) offers *Quick Plant Energy Profiler (Quick PEP)* software on its website to help determine how energy is currently being used and where opportunity exists to save cost and energy. The Department of Energy also sponsors *Industrial Assessment Centers (IACs)* which provide no-cost energy assessments for small and medium sized facilities.