

Resource Supply

The Effect of the Wood-to-Electricity Industry on Wood Fiber Markets

by Pete Stewart

In 2008, industrial production of electricity from wood (almost exclusively wood and paper products companies) amounted to 10.9 billion kilowatt hours: 8.8 billion in electricity-only facilities and 2.1 billion from combined heat and power facilities. In Oregon alone, for example, wood products companies use nearly 3 million bone dry tons of wood fiber to generate electricity or for combined heat and power applications. Wood pellets manufacturers in Oregon use more than 1 million additional tons of wood fiber, most of which are then burned to create heat and power.

What these totals tell us is that wood as a feedstock for electricity production is growing exponentially right now. The number of dedicated biomass plants that have been announced or are under construction increases every quarter. As signs emerge that the housing market is finding a bottom, and as more and more of these plants come online, competition for certain classes of wood fiber will reshape wood fiber markets.

Precipitating the growth of wood biopower are the renewable portfolio or electricity standards enacted by states. Throughout most of the country (and most of the developed world), states are setting requirements and goals for producing energy — particularly electricity — with greener and cleaner sources. Altogether, 29 U.S. states have renewable electricity standards (RES); six have renewable energy goals.

Even more significant would be the enactment of the American Clean Energy and Security Act (ACES) of 2009. Should this bill find its way to the president's desk for signature, retail electricity suppliers (those selling more than 4 million MWh to consumers annually) would be required to meet the following federal standards via a combination of renewable energy sources and energy efficiency (renewable energy must be at least three-quarters of the total):

2012-2013:	6 percent
2014-2015:	9.5 percent
2016-2017:	13 percent
2018-2019:	16.5 percent
2020-2039:	20 percent

The cap and trade provision in the bill will add further impetus to the wood-to-electricity movement.

Because there are many states in the U.S. where wood is the only significant source of renewable energy, growth in this sector will likely have a sizeable effect on the wood fiber supply chain in timber-rich areas of the country. In the South alone, if 1 percent of the electricity produced with coal were replaced by wood co-fired with coal, an additional 10 million tons of demand would be introduced into the system. A 5 percent goal would introduce 50 million additional tons of demand. This is the equivalent to one-third of the fiber market in the South today.

In addition to growing domestic demand, European countries have been tasked via the Kyoto Protocols to meet green energy targets of 20 percent by 2020. To meet this 20 x 20 goal, the U.K. — only the U. K. — will need to import 12 million tons of wood fiber. If just a third of that comes from the Eastern United States, then eight to 12 new pellet plants will need to be built to supply this demand — primarily from co-firing facilities. In July 2009, MGT Power announced it is building a 295 MW dedicated biomass electricity plant in Northeast England that will source at least part of its wood chip supply from the southern United States. As more dedicated biomass plants come online, additional wood chip demand could eclipse demand for pellets.

Growth in wood's other energy application, biofuels, is more nebulous. To date, no one has proven that cellulosic ethanol is viable on a commercial scale. While the federal government continues to support research in this area, production on a scale that would impact wood fiber markets seems unlikely for the foreseeable future.

Based on our research, we think the total annual demand from bioenergy companies by 2020 will equal somewhere in the 15-25 million ton range in the U.S. South. To put this number in perspective, 180 million tons of hardwood and pine are consumed throughout the region each year. Approximately 16 million tons of pine pulpwood is used in the region each year by OSB manufacturers. The impact of bioenergy, then, will

approximate or even exceed the effect that the OSB industry has had on the market.

How quickly will this demand begin changing the supply chain? As the price forecast shows, these changes to the wood supply chain will happen gradually over the course of the next decade. The recession, the credit crunch and lower fuel prices have slowed progress that might otherwise have been more robust over the last year.

Even the government seems to have taken this into account when setting the renewable electricity standards (RES). ACES, for instance, would require 6 percent of electricity come from renewable sources or improved efficiency by the 2012-2013 timeframe. This number is roughly equivalent to the amount of electricity produced from renewables in the United States in 2008 (see Table 4). In 2009, the percentage has risen. Though overall production has decreased over the first third of the year, renewables now represent 8 percent of the total, a fact that may be attributable to state RES legislation.

Certainly, it will be the retail electricity producers who have been slow to explore their renewable options and/or in states without renewable electricity standards (RES) that will have the largest burden if the ACES passes. Because they will have to accelerate from zero to six very quickly, competition may intensify more quickly.

What effect will the growing demand from the bioenergy sector have on engineered wood manufacturers? The answer to this question will be determined by the mix of fiber that bioenergy companies use. From least expensive and most desirable to most expensive and least desirable, the three classes of wood fiber that bioenergy companies will source as feedstock include:

- **Wood fuel or biomass.** This category is made up of harvest residues and the bark removed from trees prior to the manufacture of wood products. Today, biomass is scarce in most of the U.S. South, not because it doesn't exist, but because it is not being removed from forests. Biomass availability is determined by harvest rates. In most states, only 2 or 3 percent of forest land is harvested per year.

In addition, economic downturns reduce the number of harvests, a result of lower demand for lumber and other building products.

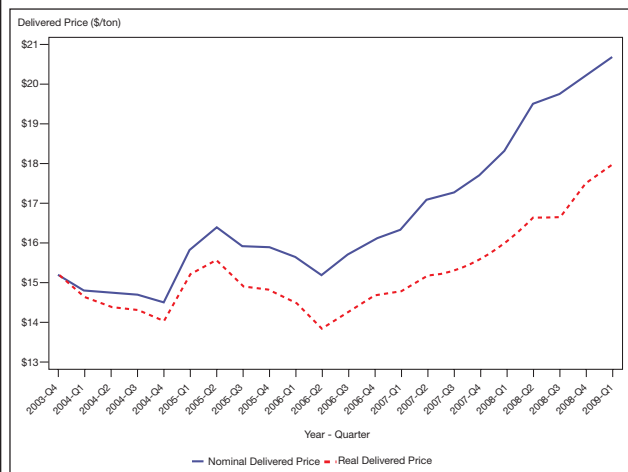
Like harvest residues, the available volume of bark will be restrained whenever mills are curtailed or closed. Second, because the market for biomass is not yet stable, few in the forest products supply chain have invested in the equipment necessary to collect this material. Forest2Market's Delivered Price Benchmark currently classifies both biomass and bark as fuel wood; our data shows that prices for this material have been trending higher over the last several years (see Table 1 for the U.S. South and Table 2 for the Pacific Northwest). Because of these limitations, bioenergy companies will be driven to substitute higher classes of wood fiber in order to remain operational.

- **Secondary chips.** Because they are by-products of manufacturing processes, the widespread curtailment of lumber manufacturing has resulted in a decrease of this material on market. Producers that need higher quality materials will be using secondary chips in many cases, though, as they are consistent in size and free from contaminants.
- **Primary chips.** Despite the high cost of in-wood whole log chips and chip mill chips, bioenergy companies will compete for them for two reasons: 1) some manufacturers who need higher-quality chips will turn to chips as chip mills offer a very consistent product when it comes to size, specific gravity and other manufacturing requirements; 2) primary chips are less dependent on other manufacturing processes and as a result are less vulnerable to the ups and downs of the housing, lumber and construction markets.

Because the bulk of the competition will occur in the last two classes of fiber — primary and secondary chips — engineered products made from sawtimber, like plywood, LVL and glulam, will be affected only on the margin. Competition for peripheral resources will intensify. Loggers and truckers, for instance, will have an additional set of customers to serve, and wood products manufacturers will find their supply chain costs creeping upward as a result.

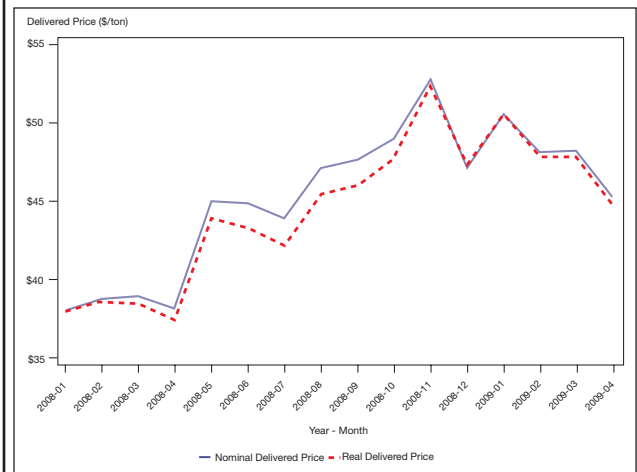
Products made from pulpwood, such as OSB and paralam, are likely to see more significant competition and therefore higher prices over time. With engineered wood products manufacturers, pulp and paper mills and bioenergy companies all competing for

Table 1: Delivered Fuelwood Price Trend – U.S. South 4Q2003 - 2Q2009



Source: Forest2Market Delivered Pricing Benchmarks

Table 2: Delivered Fuelwood Price Trend – Pacific Northwest 4Q2003 - 2Q2009



Source: Forest2Market Delivered Pricing Benchmarks

the same material, the price pressure could be significant over time. Forest2Market's 2008 study on the effects of bioenergy on the wood fiber market in the U.S. South shows in Table 3 the forecasts for pulpwood, chip and wood fuel price changes from 2008-2020.

Interestingly, the rise in the prices of products made from smaller logs as competitive pressures strengthen will make products made from larger logs more affordable. For instance, as the price gap between OSB and plywood narrows, consumers will find it easier to substitute plywood where they have been using OSB exclusively.

Ultimately, manufacturers of engineered wood products made of pulpwood should undertake a careful analysis of their supply chains. We would recommend two practical steps to help secure a supply and mitigate the effects of amplified competition. First, work now to establish strong business relations with pulpwood suppliers and loggers, especially in areas where bioenergy announcements and plans are taking shape.

Second, take a close look at the terms and conditions of supply agreements. In order to secure financing, bioenergy companies must show that 50 percent or more of their supply is under supply agreement. This means that they will be locking down supply early. In addition, they will be looking for longer term supply agreements, since that is the traditional approach in energy markets. Steps toward establishing a reputation as a preferred buyer will benefit engineered wood products companies as the supply chain undergoes sweeping changes over the next decade. ●

Pete Stewart is the founder, president and chief executive officer of Forest2Market (www.forest2market.com), a Charlotte, N.C.-based market price and trend information provider for the forest, wood products and bioenergy industries.

Table 3: US South Delivered Prices (\$ per ton)

	2007	2008-2012	2013-2017	2018-2020
Fuel Wood	21.90	23.45	26.65	28.65
Pine Chips	32.20	36.60	39.70	43.60
Pulpwood	28.47	33.60	38.00	42.00

Table 4: Net Generation Total and from Renewable Energy Sources (Thousand Megawatt Hours)

	Total	From Renewable Energy Sources*	Percentage of Total
2007	2,016,456	105,238	5%
2008	1,994,385	123,603	6%
2009**	578,397	46,038	8%

**Wood, black liquor, other wood waste, biogenic municipal solid waste, landfill gas, sludge waste, agriculture byproducts, other biomass, geothermal, solar thermal, photovoltaic energy, and wind.
*Through April 2009
http://www.eia.doe.gov/cneaf/electricity/epm/table1_1.html#_ftn4

Source: Electric Power Monthly, Energy Information Administration

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