TOUGH TIME TO TRY TO SELL BIOMASS FUEL:

Plummeting Energy Prices Make Biomass Electricity Even Less Competitive

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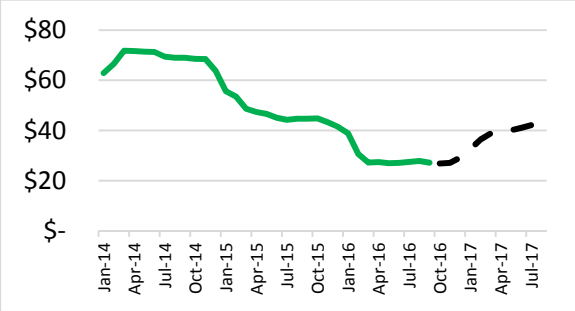
The following article was originally published in
***The Northern Logger and Timber Processor Magazine*, November 2016**

A Hard Time to sell Electricity (or Supply a Biomass Plant That Does)

Some days, when I look at wholesale electricity prices in New England, I can't figure out why biomass electricity plants are operating. After paying for wood fuel, staff and operations, it is hard to find any profit.

Biomass is an important market in the Northeast. In 2014 (the last year with full information), it accounted for almost a quarter of the total volume of wood harvested in Maine. New Hampshire, with 8 stand-alone biomass electric plants, saw record use of 2.6 million tons in 2015. Yet rapidly changing energy and policy markets call into question what this market will look like a few years in the future.

Wholesale electricity prices have been dropping steadily in the region. In March of 2014, the trailing 12 month average price for wholesale electricity in New England was $72 per MWh; in September 2016 the trailing 12-month price had dropped to $27 per MWh. The futures market suggests a modest uptick in wholesale electricity prices, but nowhere near enough to make biomass plants economically attractive without some other revenue stream.



For most biomass plants, that other revenue stream is Renewable Energy Certificates, or RECs. RECs are a way to account for the "renewable" part of electricity, and electricity providers and utilities around the region are required to purchase a certain amount each year. In short, RECs are a state-mandated market designed to support renewable energy.

A big problem with state mandated markets is that states can change the rules. And that is happening to biomass – with real impacts on the ground. The Massachusetts REC market this year started mandating an efficiency standard that is simply not possible for a stand-alone biomass plant to meet (at least using commercially viable technologies). The result: Covanta's biomass two biomass plants in Maine were disqualified from the Massachusetts REC market – the only high-value market they qualified for – and as a result closed. That's a market for about 55 truckloads of chips – every day, all year – that disappeared.

Connecticut, another high-value market for RECs, is expected to phase out support for biomass in the coming years. As a result, we may see plants in Maine, New Hampshire and Vermont taking a hard look at continued operations.

This isn't a huge shock. While biomass has enormous economic benefits, those benefits are highly localized. The loggers, plant employees, forest management benefits, diesel purchases all benefit the area right around the plant. With a few exceptions, these plants are in rural areas of Northern New England. The economic support for these plants – until recently – came from Massachusetts and Connecticut.

What could go wrong? We're finding out.

In addition to current and potential losses at stand-alone biomass plants, the region is losing biomass markets as pulp mills fold. My firm, Innovative Natural Resource Solutions LLC, estimates that since 2014, Maine has lost 1.2 million tons of biomass markets at pulp mills. Of course, some of this came from the bark and fines of purchased pulpwood, but much of it came from loggers around each mill.

Things Are Happening

So that's the bad news. But it's not all doom and gloom. A few of the biomass plants in the region have long-term Power Purchase Agreements, or PPAs, that provide a stable electricity rate for the coming years. For example, Pinetree Power in Ryegate, Vermont has about 6 years of contracted electricity purchases. Burgess BioPower, at the former pulp mill site in Berlin, New Hampshire, began operations in late 2013 with a PPA that lasts up to 20 years. (The "up to" is important – there is some complexity in the PPA that deals with above-market costs, potentially triggering ways that the PPA could become less stable in future years.)

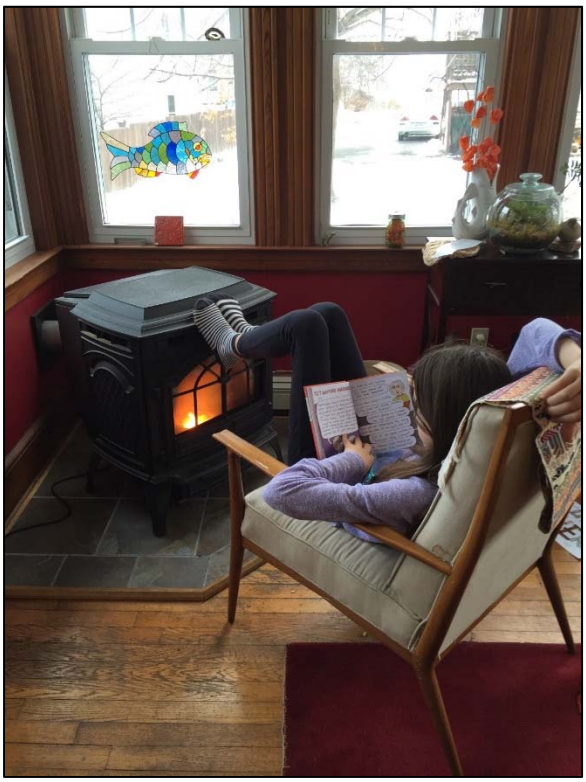
New Hampshire has a "Class 3" REC market specifically designed around legacy biomass units – those plants that began operations before 2006. That's six plants – Hemphill, Tamworth, Bridgewater, Alexandria, Bethlehem and Whitefield. To date these facilities have been relying upon the Connecticut REC market for support, but as discussed that market may be less supportive in the near future. New Hampshire's Class 3 REC market may be key to continued operations of some or all of these facilities in the very near future.

In Maine, the state legislature allocated a little over $13 million to support 80 MW of biomass plant over the next few years. Bids were submitted in late July; an award of these bids has not been announced as *The Northern Logger* goes to press. It is expected that at least some of this money will be used to support biomass in Aroostook County (ReEnergy has biomass plants in Ashland and Fort Fairfield), and the remainder in the rest of the state. The Maine legislature also established a Biomass Commission, which has been meeting over the summer to evaluate ways to support and expand the state's biomass industry. That Commission is expected to complete its' work in time for the new legislative session in January. What they recommend, and how it is received by the legislature, is an open question at this point.

We are also seeing some creativity, and may see more. While Covanta closed its facilities, others have looked at reduced operations. For example, some facilities are evaluating a model where they operate during the seasons of peak electricity prices – summer and winter – and cease operations during the spring and fall when electricity prices drop. This is an obvious hardship for suppliers, but an option preferable to closure.

It's Not All Electricity

While biomass and electricity are closely linked – because it has been the dominant use in the region – it's not the only possibility. Wood for thermal uses – space heating and industrial process heat – continues to be an important market in the region. A warm winter last year and low oil prices (by recent standards) have put the brakes on growth in this market, but the region remains ready to embrace more wood heating.



For example, F.E. Woods just announced that they have completed financing for their wood pellet mill in Baldwin, Maine. This facility expects to use white pine – including mill residue from local sawmills – to produce wood pellets for sale in the region. New biomass heating projects are just now underway at schools and universities in the region – providing local heat and local economic benefits. These are important markets – and more should be

encourage and supported, but it's important to realize that these markets are modest, seasonal, and distributed. (A 50 MW biomass power plant uses around 600,000 tons of wood fuel each year; an elementary school around 600 tons and a college around 20,000 tons. Each project is a little different, but the scale of the market is accurate).

One large biomass thermal district heating project, Concord Steam, will close permanently. This facility, which used about 40,000 green tons of wood fuel annually to heat the New Hampshire Statehouse and many downtown buildings, will cease operations after being purchased by the local natural gas utility.

In Maine, a firm with significant experience in Europe has reportedly purchased the idle Covanta facilities, and has ambitious plans to diversify the products from those units. In addition to electricity, Stored Solar LLC has suggested combined heat and power applications such as greenhouses and aquaculture, the production of biofuels and bio-chemicals, and other products that provide high-value opportunities from low-value feedstock. It is far too early to tell how this venture will unfold, but if successful would provide a new blueprint for the region's biomass plants.

A Maine non-profit – Biobased Maine – recently received a half million dollars in federal funds to develop a bio-product roadmap in cooperation with the University of Maine. The group will be evaluating wood availability, the supply chain, conversion technologies and markets to identify areas where Maine (and presumably other part of the Northeast) can capture increased value from the forest. Of course, this isn't the first time that such markets have been evaluated, but technologies continue to advance and markets change, providing opportunities where before there were none.

What's Next?

Biomass electricity has a tough road ahead of it – and the loggers that supply these facilities need to think hard before the next chipper purchase. Absent some real policy intervention or markets rebounding in unpredictable ways, the biomass market in the Northeast will be much smaller in three to five years.

But it's not all doom and gloom. The dramatic loss of markets in the region – led by the loss of pulp mills in Maine – presents opportunities to develop projects that a few years ago were unthinkable. Developers looking at projects that use biomass or low-grade softwood have probably never been in a better position to capture opportunities in the region. The region has a robust supply infrastructure – while it can hold onto it – that is experienced in growing, harvesting, processing and transporting wood.

There are opportunities, and they will be developed. The real questions are when, where, how large and how stable will these markets be.