Forest Biomass Supply & Economic Concerns

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Natural Resources
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Emerging Issues

Forest Biomass: Supply and Economic Concerns

Concurrent with the growth of interest in wood-based energy products and growing concerns about multiple facilities being proposed in the same region, questions have been raised regarding whether the increased demand for forest biomass to fuel these facilities will result in the use of whole logs to generate energy.

The short answer is "no."The reason for this is a matter of economics. There has long been a pricing hierarchy of timber products. This hierarchy is driven by an underlying value hierarchy. The value hierarchy is determined by the consumers (mills, end users, etc.) of the forest products and what they are willing to pay.

Current delivered log price hierarchy for log grades and biomass

Special Mill Logs- 16"+ diameter Saw logs that can yield > 65% select grade lumber. Select grade lumber is the highest grade of structural joists and planks. This grade is applied to lumber of high quality in terms of appearance, strength, and stiffness.
***$102.16/green ton or $204.32/bone dry ton**

#2 Saw Logs- 12"+ diameter Saw logs that can yield > 65% construction and/or 25% in higher grades of lumber. Construction grade lumber is lumber that is suitable for ordinary and light construction.
***$93.92/green ton or $187.84/bone dry ton**

#3 Saw Logs- 6"-11" diameter Saw logs that can yield > 33% standard and better grades of lumber. Standard and better grades are 2"x2" through 4"x4" and are the building staples of residential and light commercial construction.
***$80.83/green ton or $161.66/bone dry ton**

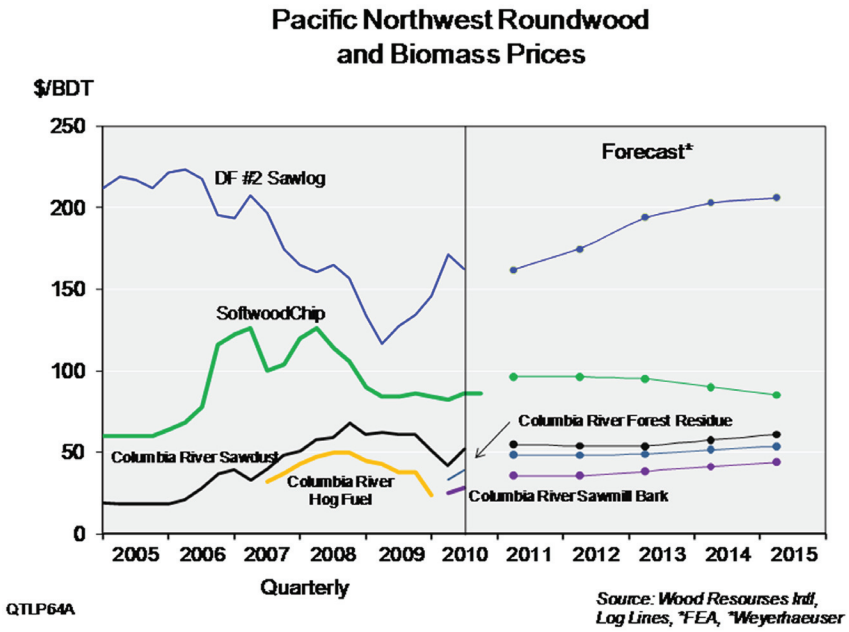
#4 Saw Logs- 5" diameter Saw logs that can yield > 33% standard and better grades of lumber.
***$65.00/green ton or $130.00/bone dry ton**

For more information on log grades and price hierarchy, see side bar on page 2.

Utility/pulp logs- Logs that do not meet the minimum requirements of saw log grades but can yield paper chips.
***$36.49/green ton or $72.98/bone dry ton**

Forest Biomass- Forest residues that do not meet the minimum requirements for pulp logs. Forest biomass is residual branches, needles, and tree tops (called "slash") left over from ongoing logging operations. Forest Biomass is also the products of pre-commercial thinning (small saplings from overcrowded young forests). Tree stems and tops thinned from forests that are at risk from wildfires, insects or diseases (forest health treatments) that are not currently utilized is another form of Forest Biomass. Lastly, unused material from lumber mills, such as sawdust, shavings, wood chips or bark is considered Forest Biomass.
***$25.00/green ton or $50.00/bone dry ton**

Timber Based Product Trend Prices in Bone Dry Tons



Traditional forest logs are sold by grade into a variety of markets within the price structure described above. Manufacturers mill these logs into a variety of products from plywood to 2 X 4's. Forest products manufacturers purchase grades of logs that maximize their profitability. As is demonstrated above, utilizing whole logs for bioenergy will result in a net economic loss.

For example: A mill producing framing lumber will purchase smaller logs at a lower cost to produce 2x4's and 2x6's. These mills purchase logs in the #2-#4 saw mill specifications. The average log price for these mills is $79.92/green ton. The profitability of this mill is dependent on current lumber prices. Current lumber prices are

INFORMATION REGARDING PRICE HIERARCHY

GREEN= Prices from DNR December 2010 delivered log volume report

ORANGE= Saw log definitions from Northwest Log Rules Advisory Group; Log Scaling and Official Grading Rules for 2011

Brown=Pacific Northwest Roundwood and biomass Prices provided by Weyerhaeuser, Wood Resources, Log Lines, and FEA 2010

Converting saw logs into energy is cost prohibitive

A bioenergy facility would have to compete with sawmills to purchase these logs at market price.

That means electrical consumers would have to be willing to pay 3 times the current cost of electricity.

used as a market signal for log prices. Mills bid on logs at a price that allows them to be profitable in making lumber. $79.92/green ton is the current highest price at which mills can purchase logs and be profitable.

A bioenergy facility would have to compete with sawmills for purchase of these logs and pay at least $79.92/green ton as timber owners will sell to the highest bidder. The electricity that the bioenergy facility produces would have to be sold for 19.2 cents/kWh just for the bioenergy facility to breakeven. This cost does not include a profit. The current cost of electricity across all energy sectors in Washington is 6.62 cents/kWh according to the EIA (Energy Information Administration). This means the electrical consumer would have to be willing to pay 3 times the current cost of electricity. The average electrical rate in the U.S. is 9.7 cents. Washington has one of the largest supplies of energy in the nation due to readily available hydroelectric power, leading to the low cost of electricity in the state.

Bioenergy facilities are therefore unable to purchase logs to produce energy because of the high cost. Consequently, the only economical products for bioenergy facilities to purchase for energy production are the by-products of traditional saw timber harvests. There are several reasons for this. One reason is that there is little competition for this by-product resulting in its lower prices and there is no higher use for it. Facilities could conceivably compete for pulpwood logs. However, the cost of breaking even on producing electricity is still much higher than current prices.

Second, the supply of forest biomass available to bioenergy facilities will be driven by demand for saw timber and the resulting amount of forest harvesting. Consequently, the feasibility of bioenergy facilities is largely dependent on the size of the facility. The facility has to be scaled to ensure that it is consistently supplied during saw timber harvest fluctuations over time. If the facility is too big, it has the potential to run out of forest biomass to produce energy. Avista energy in Kettle Falls, Washington is an example of the need for consistent low cost supply of biomass. Avista has had numerous production curtailments due to the lack of forest biomass. Avista has not been able to sell electricity at a rate that would pay for the use of pulpwood logs as a substitute for forest biomass. In many ways, projected timber harvest trends will define the sustainable scale for a forest bioenergy facility.