

Is Seeley Lake Ready For Biomass Energy?

By William Wall

Why biomass?

The community of Seeley Lake has been consumed with timber management issues and fire for many years. Recent meetings have focused on forest treatments, stewardship contracts, fuel mitigation and real estate development. One way of tying all these factors together for the community is to look at woody biomass utilization. Establishing a process for burning wood waste in boilers instead of in the woods is currently being discussed by using a cogeneration facility. However, there is more to a 'co-gen' facility than just putting in a boiler, and there is more to forest biomass use than 'co-gen'.

Probably the most critical and politically correct view of the process is that burning wood to displace fossil fuels is considered "carbon neutral". As trees grow, they pull carbon out of the atmosphere, acting as carbon 'sinks'. When they die, decompose, or are burned, they release that same amount of carbon. Theoretically, there is no net gain of CO₂ in the atmosphere and growing plants and trees will continue to cycle that CO₂. Most people who compare the wood/plant material process to the burning of fossil fuels like petroleum and natural gas, focus on the release of ancient carbon that has been deep in the earth for years and the release creates a carbon imbalance in the atmosphere. Creating local economies of using biomass for energy production is an effective way to enhance local forest and community sustainability.

What is forest biomass?

Woody biomass is any slash, dead or dying trees, or fire killed trees that are not used to make lumber. Biomass in the Seeley Lake area includes slash, bark/hog fuel, saw dust, shavings, chips, and pulp logs. Each of these types of biomass can be made into various energy products including steam, electricity, heat for buildings, and various wood fuels such as pellets, briquettes and hog fuel. At Pyramid Mountain Lumber, 100% of the wood and by product residuals coming are currently being used or sold for various uses. But some of these residuals, as well as slash left in the woods, could be put to higher economical energy uses. However, any biomass utilization for energy business must make sure the supply is sustainable, meets the needs of the conversion process, and has a readily available market for the end product.

Forest Biomass Energy production

Producing energy from wood products has been around for centuries. Most of the energy has been in the form of steam or heat. Recently, wood products, along with agricultural and municipal waste, have been the focus of alternative electrical production. While boilers burning wood products are fairly inefficient for producing electricity, there are other very beneficial outputs to consider.

Wood Heat – used as cordwood, pellets, chips, or briquettes, woody biomass can be used to generate space heat for residential, commercial and institutional application, and is commonly used by forest industry to generate heat (such as biomass boilers at pulp and paper mills or wood-fired kilns at sawmills). As oil and other fossil fuel prices rise, woody biomass will, in many cases, become attractive for expanded industrial application, and could be used by industries with large thermal energy needs unrelated to the forest products industry.

Electricity – using well-established technologies, wood can be used to create electricity for use on-site or for sale to the regional electricity grid. Biomass electricity facilities currently exist throughout the country, with large numbers operating in the Northeast and California.

Liquid fuels – the use of wood to create liquid fuels for transportation is an area of significant research and development activity, branching into the commercial arena. The most high-profile liquid fuel potentially derived from wood is cellulosic ethanol, but other candidate liquid fuels include pyrolysis oil, methanol, butanol, Fischer-Tropsch diesel fuel, and an organically-derived gasoline. The technology works and is being developed into profitable business opportunities. Making the process fit Seeley Lake and getting financing for one of the processes would be difficult, but possible, if such a plant could be scaled to the correct size for our local biomass production, and made profitable it would provide an excellent opportunity for our community.

What kinds of systems would work in Seeley Lake Today?

A new boiler and an appropriately scaled Combined Heat and Power CoGen plant at Pyramid Lumber is a possibility. CoGen CHP produces steam for drying lumber in the kiln and uses steam turbines to produce electricity for on-site use, local use or sold to a larger utility as green electricity. Carbon credits and other tax benefits may come as part of a financing package. A properly sized CoGen plant in Seeley will increase the need for hog fuel, which could be supplied by using more of our unused slash currently left in the woods and burned. As of November 2006, biomass was the second most widely used renewable fuel for electricity production in the United States with approximately 60% of the current biomass powered electricity generation in the United States is in the form of highly efficient CHP.

Other products that might possibly be produced on a commercial scale at Pyramid Lumber include, wood pellets, biomass briquettes, or chips for boilers to produce heat that can be used in kilns, space heating, residential or industrial heating or greenhouse heat. A very successful program in Montana is 'Fuels for Schools' with over x number of installations. These wood chip fired boilers have demonstrated how wood can be used for heat at a lower cost than propane, while adding value to our forest product industries.

A real opportunity in Seeley Lake is to connect the upcoming sewer project. In the commercial area of town the system could be combined with a district heating system. Piping for this project would be installed simultaneously with the new sewer pipes reducing the costs. Heat would be transmitted to commercial buildings that wanted to participate by insulated pipes carrying hot water. A heat exchanger would then convert the hot water to each building's current system of hot air or hydronic heat. The building would only pay for BTUs used; a significant savings over propane. This approach has been extremely successful in Europe, and was, at one time, used to heat all major buildings in cities throughout the US. Most of this infrastructure could be paid for by government grants. The concept is similar to 'Fuels for Schools' but on a bit larger scale.

Benefits for Seeley Lake

1. Enhance forest management through fuel mitigation and economic harvest of lower value products such as slash, burnt trees, and bug killed trees; Increased opportunities for ecologically based restoration of our forests;

2. Additional value added products for Pyramid Mill which can support greater profitability for the mill; this leads to more job stability in the mill and in the woods;
3. Utilization of slash increases profitability for harvest operations, reduces smoke emissions from open burning;
4. Increased local energy sustainability and potentially reduced energy costs for heat locally.
5. Reduced emissions

In Seeley Lake, where current infrastructure exists through Pyramid Mountain Lumber, linking slash and other mill biomass residuals to create a higher economic use of forest biomass will benefit the mill as well as loggers and forest managers. Additional types of equipment and capital investment are needed to process the biomass, whether it is electricity, heat, solid products such as pellets and briquettes or liquid fuel products that are the desired outcome. Studies are in progress to determine the most practical and economically viable approaches.

Date: March 26, 2009