

Alternative Energy for Southeast Alaska

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Craig, located on Prince of Wales Island, may soon become known as the community where biomass fuels all started in Alaska. The change to using wood waste or woody biomass to heat private homes, community buildings and schools has been significant.

Ellen Hannon has been heating her 5,000-square-foot home in Craig with a Heatmor boiler for the past two years. "It burns split firewood in a chamber that heats water," she says, "and then the water is piped through the house in baseboard heaters." The boiler could actually heat 10,000 square feet, so she is planning on building a heated garage. Hannon isn't the only one with this idea.

In a drive though Craig, you will find several homes that are using this "Outdoor Wood Boiler," or OWBs, for heating. "With the rising cost of heating fuel," says John Steinberg, the pastor of the Craig Church of God, "it just makes sense." The church has been heating its building, as well as its domestic hot water, with an OWB for a little more than a year and staff and members are pleased with the savings they have realized. "We use a about one-half wheelbarrow load per day in the summer, and one full wheelbarrow load of split wood in the winter, instead of buying several hundred gallons of diesel," says John Steinberg. For an investment of a few thousand dollars, the church will see its boiler paid off in just a few years.

NOT NEW

The conversion to heating with wood heat is not a new idea. In fact, according to the Alaska Energy Authority's Peter Crimp, Alaskans use more than 103,000 cords of wood a year to heat their homes. Most of these wood burners are indoor wood stoves that mainly heat the air inside the home. Outdoor wood boilers are not new either, they are quite common in Northeastern States, but in Alaska they are just now catching on. There are dozens of brands of OWBs on the market. but they all work in a similar fashion: They burn wood in a large fire box that, in turn, heats water in a water jacket. The OWB is located outside, as far as 500 feet away from the home, and the hot water is piped to the house underground in insulated pipes. These boilers are designed to work with any style of existing heat in the home, including forced air, radiant baseboard or radiant floor heat.

ENTER SAWMILLS

Homes in Southeast Alaska are not all that is being heated with OWBs. The sawmill industry is taking advantage of this technology to dry wood. The valueadded wood industry is benefiting from this use of outdoor boilers to heat kilns that dry wood for construction and other uses. "We don't have to settle for selling rough-cut green wood anymore," says Dick Jones, owner of a

sawmill in Craig. "We can sell dried lumber for any use at all." Dick Jones has been drying wood in a Timber Wolf kiln for the past six years, and his fuel source is right out his back door in his waste woodpile.

WHY BIOMASS?

Why consider biomass? With the rising costs of petroleum-based fuels, it only makes sense to consider other energy sources. Wood energy is a renewable fuel source and nationally 80 percent of the U.S.' biomass energy comes from wood. In fact, according to the U.S. Energy Information Administration (EIA), the largest part of the 6 percent of energy that comes from renewable sources (primarily solar, wind, hydro and biomass) comes from biomass. Most of this energy comes in the form of heat, but again, nationally, 60 percent of all the energy used in the United States goes to heat buildings. So why not use wood? Biomass is carbon neutral, which means that burning it does not contribute to global warming, unlike burning fossil fuels. When biomass is burned for energy, using wood from sustainable forestry practices, there is no net increase in the greenhouse gases that cause global warming. In Southeast, the residue left over from logging operations is not utilized, and can reach up to 40 tons per acre. Sawmill residue is burned to get rid of the debris, so why not burn it where it can do some good?

EXPANDED OPPORTUNITIES

Outdoor wood boilers are not the only woody biomass burning applications occurring on Prince of Wales Island. The City of Craig has embarked on an ambitious project designed to heat the municipal pool, elementary school and middle school. "Several years ago we were looking at converting our fuel source from propane to diesel," said Jon Bolling, city administrator for the City of Craig. "When the price of diesel started to climb, that's when we took a look at wood." Modeling their project after the "Fuels For Schools" project in Darby, Mont., the City of Craig looked at heating a series of school buildings and the swimming pool with a large boiler that would burn sawmill residue, such as wood chips and sawdust. After much consideration, the City of Craig selected a gasifier built by CHIPTEC. A gasifier (sometimes called a two-chamber system) actually has two burn chambers where the wood is burned in one chamber, converting the heat to gas, which is then burned in a second chamber. The advantage of this type of system is that there are virtually no emissions, and the fuel is used more efficiently. The Craig biomass project plans to burn about 750 tons of wood waste per year, and at current market rates for wood chips, that equals about \$30 per ton or \$22,500 per year, compared with the annual cost of heating the swimming pool alone with propane, coming in at more than \$60,000 for the year. Energy savings to the school district will amount to about \$20,000 per year. Gov. Frank Murkowski and Sen. Lisa Murkowski visited the site of the proposed Craig biomass project, and were impressed when they learned that two pickup truck loads of wood chips per day would keep the plant running.

SOLUTION FOR SOUTHEAST

Although biomass may not be a panacea for solving all of the looming energy problems facing our state, it certainly fits the bill in Southeast where there is a timber industry and a ready source of material. Other parts of Alaska are faced with issues such as natural fuel loading that

contributes to forest fire intensity, or large acres of Spruce Bark Beetle-killed trees. Biomass utilization might be a consideration in these areas.

On Prince of Wales Island, other significant biomass projects are already being studied. The City of Thorne Bay is considering an OWB to heat municipal buildings, including City Hall, the library and fire hall.

The U.S. Forest Service's Thorne Bay Ranger District is discussing a large boiler system to supply heat to the district office, warehouse, bunkhouse and employee housing.

Tommy George of Klawock installed a Heatmor boiler at his home in Klawock a year ago. Currently he heats his own house, as well as his mother's house. He is very pleased with the conversion, and uses about 14 cords of wood per year. "The adaptation of the boiler to the existing system was simple since the houses were already heated with a baseboard system," he says, "And it works great!" Suggested Web sites for more information:

www.akenergyauthority.org

Alaska Energy Authority

813 W. Northern Lights Boulevard

Anchorage, AK 99503

907-269-3025

http://alaskawoodheating.com/home_heating.php

University of Alaska Cooperative Extension Service

2221 E. Northern Lights Boulevard, Suite 118

Anchorage, AK 99508-4143

877-482-3223

www.alaskawoodtech.org

Ketchikan Wood Tech Center

P.O. Box 519

Ward Cove, AK 99928

www/fuelsforschools.org

Bitter Root RC&D

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