Peterborough Town Library heated, cooled with wood chips

Froling Energy installed high-efficiency dried wood chip boiler in conjunction with major building renovation.

By Jim Van Valkenburgh
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After a major renovation, the Peterborough Town Library is now a modern building with an updated heating and cooling system.

An old house that sits across the parking lot was and will remain the library's used bookstore, but the rear portion was transformed into the library's new boiler room. This is where an innovative dried wood chip boiler and absorption chiller were installed — key elements of a compelling innovation at the library that could be used in buildings across northern New England: the use of a wood pellet or wood chip boiler as the source of both heating and cooling.

How do you cool with a boiler? A high-efficiency Froling T4-150 dried wood chip boiler generates 190-degree hot water and stores it in a 600-gallon buffer tank. When an area of the library needs heat, circulators pull hot water from the tank and send it through the pipes to where it is needed. When an area requires cooling, hot water from the buffer tank is circulated through a Yazaki 10-ton absorption chiller that outputs chilled water that is also pumped over to the library. Yes, it is true: the absorption cycle creates cool water from hot water like a heat pump but it uses water as the refrigerant. It doesn't use any CFCs, so absorption is a very climate-friendly way to cool.

Froling Energy processes and delivers the screened dried wood chips, called PDCs, that fuel the Peterborough Town Library and many other schools and industrial buildings in New Hampshire and Vermont. Locally sourced from our region's managed forests, PDCs are clean burning in high efficiency boiler systems that Froling Energy installs. PDCs are delivered by blower truck into above-ground silos like the one at the library.

Four buried insulated pipes run under the driveway to the new library: two are supply and return pipes for heated water and another pair is for chilled water. These run to air handlers placed throughout the building for delivering heating or cooling, as needed.

The entire boiler and HVAC system was designed by Wilson Engineering and installed by Froling Energy. Partial funding for the absorption chiller was from a grant from the New Hampshire Department of Energy. The biomass boiler system is generating NH Class 1 Thermal RECs which reduces heating costs down to $6.25 per MMBTU. The absorption cooling system is 10% less costly to operate than the standard electrically powered chillers. A large solar array is now on the roof of the new addition, with a capacity of 71 kilowatts, installed by Revision Energy.

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