Energy from wood: Minnesota vs Finland

By Aaron Hagstrom

Minnesota could be a superb place for the wood-based renewable energy business, with its thousands of acres of timberland, says Risto Sivula, president of the Finnish-American Chamber of Commerce. Wood is, after all big business for Finland, so why not for Minnesota?

One of the simplest ways to obtain energy from wood is by burning, which produces steam that drives a turbine and generator. The generator produces electricity and the waste heats water. Combined Heating and Power (CHP) systems are designed to harness this energy from a central plant. This is ideal for Finland, which has forest over about 75 percent of its total land area, or about 57 million acres, making it the most forested country in Europe. In comparison, Minnesota has about 32 percent of its land, or 17 million acres, forested, mostly in the Northeastern portion of the state. About 13.7 million of this is commercial timberland.

"We have no oil or gas, only a few metals, and a climate not that well suitable for agriculture," said managing director at the Forest Finnish Association Anders Portin. "This is why we have to rely on our forests and have learned to use them in an effective and sustainable way."

Wood energy is renewable, sustainable, cleaner and more efficient than traditional gas, coal or oil plants that America depends upon. In 2011, wood-based fuels made up 23 percent of total energy consumption in Finland, according to the Finnish Forest Association.

Sivula says an economy that uses CHP can create more jobs for the local economy; for instance, local truckers would be contracted to ship wood from forests to the processing plant and there would be more workers needed for the plant.

It was in the United States, more than 100 years ago, that Thomas Edison first invented CHP. His 1882 Pearl Street Station was the world's first central power plant. In Minnesota, District Energy-St. Paul, founded by a Swede 30 years ago, in addition to other services, distributes heat and electricity from the largest wood-fired CHP plant serving a district energy system in the nation. It produces about 65 megawatts of thermal energy for District Energy and 25 megawatts of electricity for Xcel Energy. Fifty truckloads of woodchips are delivered each day from within 60 miles.

"The company heats about 80 percent of the commercial, residential and industrial buildings in downtown Saint Paul and adjacent areas, including the State Capitol Complex and all downtown city offices," the company website says.

There have been several recent policy measures to assess whether and how CHP might be deployed in Minnesota. The Minnesota Department of Commerce was awarded a U.S. Department of Energy grant in 2014 to develop an action plan for CHP deployment. Over the past two years, Commerce has funded two research studies on CHP opportunities specific to Minnesota.

The research studies found economic and technical difficulties. The economic viability of bioenergy CHP is dependent on a range of site-specific factors, like cost-effective access to biofuel, Zoet said. In addition, historically, utilities have discouraged CHP projects through interconnection requirements and standby rates, among others, Zoet said. In addition, the technical potential for bioenergy cannot yet compete with that for natural gas.

"The technical potential for bioenergy CHP among current energy users in Minnesota is about 230 MW, much smaller than the potential for natural gas CHP, which is generally more cost-effective and more likely to be used in urban areas with access to gas pipelines," said the Energy Policy Planner at Minnesota Department of Commerce, Adam Zoet.

Another challenge for Minnesota is the division of timberland into smaller and smaller parcels with multiple owners, which can make it difficult for companies to harvest the wood. The Minnesota Forest Resources Council conducted a pilot study in Itasca County in 2007 that found forest was being parcelized and developed on a large scale. This has not kept other forestry products companies like the Finnish forestry company UPM Blandin Forestry — which sells paper, energy, and timber — from being one of the largest private owners with 187,876 acres of timberland.

The small town of Finland, Minnesota, in the northeastern corner of the state, recently incorporated geothermal technology into its community center; Finnish lodges and saunas of immigrants can still be seen.

"This is one of the few places I know of where citizens will vote to increase their own taxes to pay for something that is for the good of the community," said Honor Schauland, director of the Friends of the Finland Community. "I do think that is strongly related to the Finnish heritage of the area."

The country of Finland is successful partly because of its privately-owned family forestry model, in which forestland is passed from one generation to the next, Portin says. Family forests account for 61 percent of all of Finland's productive forests. 440,000 private forest holdings owned by almost 1 million forest owners, according to the Food and Agriculture Organization of the United Nations. In Minnesota, the government owns 57 percent and private individuals 38 percent. Finnish forest holdings are small, with the average holding being 56 acres. This has largely been a benefit though it comes with challenges as well.

"Two thirds of the forest area is owned by private families and because they are more in the southern part of the country and because they are well tended about 80 percent of the wood Finnish wood used by the industry is from private forests," Portin said.

However, this doesn't mean there are not difficulties as well; many private owners means that forest can sometimes be difficult to access.

"Not all forest owners are that dependent on their forests and some do not want to cut their forest at all. There is plenty of wood – but it is tricky to get it to the market," Portin said.

Sivula believes Finnish energy companies could revitalize the Minnesota renewable energy sector by driving up competition thereby making a stronger business environment for renewable energy. Two organizations that currently support Finnish industry in the United States are FinPro and Team Finland; however they have focused mainly on the three regions of Houston, New York, and Silicon Valley, Sivula said.

Sivula hopes that the International Biomass Conference and Expo, which being held in Minneapolis this year, will draw more Finnish interest in the state. The Minnesota chapter of the Finnish-American Chamber of Commerce said that the Finnish companies Benet Oy, Konecranes, Poyry and Valmet will be participating.

Editor's note: *Aaron Hagstrom is a recent graduate of the Annenberg School of Journalism at the University of Southern California. His focus is on the intersection between technology and business. Some of his articles have been published in the "Financial Times."*