

McNeil plant qualifies for SPEED program, but how green is biomass?

June 20, 2010

Burlington Free Press

Willwerth, Pat

Despite a recent well-publicized report questioning the virtues of woody biomass electricity, the Joseph C. McNeil Generating Station in Burlington, once the largest wood-fired facility in the world, recently qualified for a statewide renewable energy program.

The SPEED program, passed during the 2005 legislative session, promotes in-state renewable energy that benefits Vermont both environmentally and economically. Vermont hopes to generate 20 percent of the state's load with Sustainably Priced Energy Development (SPEED) resources by 2010.

McNeil, which produces almost all of its electricity through burning wood, qualified for the program after installing a regenerative selective catalytic reduction system in 2008, which reduced the plant's nitrous oxide emissions.

The nitrous-oxide reduction qualified the plant to sell renewable energy credits in the Connecticut market. The price of credits sold by McNeil has been as high as \$50 per credit, and as low as \$7, but after 18 months the revenue earned from selling the credits exceeded the \$10 million it cost to install the nitrous-oxide-reduction system.

"It was a good risk, and I think it paid off," said plant manager John Irving.

The increased revenue from selling renewable energy credits also gave McNeil the freedom to set its bid price below its fuel costs, which allowed the plant to operate more hours than it had previously. The extra energy produced from these additional hours qualified for the SPEED program.

The plant fulfills the economic requirements set forth by the SPEED program, employing 40 workers within the plant and some 80 workers in the forest to cut trees. The plant also attracts a couple thousand visitors every year and inspires renewable-energy conferences to come to Burlington, Irving said. He estimated the plant has pumped about \$300 million into the local economy since its conception in 1981.

The plant itself is an intimidating structure, with conveyor belts running in and out of the walls, a smokestack and two cooling towers rising in the air. The nitrous-oxide system attached to the base of the smokestack lets out a loud clang every two minutes as doors swing open and shut to change the direction of the gas-flow. Two front-end loaders patrol outside, moving wood chips from one enormous pile to another.

Inside, a shift manager sits in the control room, watching screens that show computerized images of cylinders filled to different levels. In the boiler room, an enormous, thick-walled chimney rises up through the center of the floor and disappears into the ceiling. When the small doors on the side of the chimney are opened, the heat blasts against visitors' faces, and they can see flames inside.

No more than five people are on duty at the plant at any given time.

How sound is biomass?

The environmental friendliness of wood-fired electricity is the subject of heated, intensifying debate.

Earlier this month, the Manomet Center for Conservation Sciences, a conservation group based in Manomet, Mass., released the results of a six-month study commissioned by the Massachusetts Department of Energy Resources.

“The central message of this study is that the carbon accounting for using wood harvested from Massachusetts forests for energy is more complex than most people previously thought,” Manomet president John Hagan wrote in the report.

One of the more damaging conclusions of the study is that while for decades many have thought woody biomass energy to be carbon-neutral, it might take much longer to reach this neutral state than once believed.

When harvested forests re-grow, they naturally absorb carbon from the atmosphere. The initial amount of carbon released from burning fuel is called carbon debt, and when the carbon absorbed by forest growth exceeds the initial amount released, any further absorption is referred to as a carbon dividend.

The length of time it will take to reach a carbon dividend by burning wood is dependent on what source of fuel the wood is replacing. According to the Manomet study, when woody biomass is used to replace coal-powered electricity, it takes 21 years to reach a carbon dividend. When it replaces gas-powered electricity, the carbon debt will not be paid off until more than 90 years later, the study found.

The report also states that biomass plants can reduce the time required to pay off carbon debt by producing both thermal and electric energy. If a plant were to produce both heat and electricity and replace oil technology, the carbon debt would be paid off in only five years.

The study notes many of the conclusions are specific to the situation in Massachusetts, but it also states “the framework and approach that we have developed for assessing the impacts of wood biomass energy have wide applicability for other regions and countries.”

Biomass in Vermont

Irving said he and his co-workers are all well aware of the Manomet study. “We're concerned,” he said. But he added he has some issues with how the study was conducted.

“It's flawed,” he said. “Many people have evaluated this — many people more credible than those people — and they're the only ones who came to this harebrained conclusion.”

Irving said the Manomet study uses greenhouse-gas-emission figures taken from a National Renewable Energy Laboratory study conducted in 2000. The only figures from

the laboratory study the Manomet study neglects, Irving said, are those related to biomass emissions, on which Manomet did its own research.

Irving also said trees decomposing in the forest ultimately will release just as much carbon as they would if they were burned for electricity, and additional fossil fuels would have to be burned to create the energy the wood could have produced.

He also said the waste wood McNeil uses would end up in a landfill if the plant didn't burn it, where it would take up valuable landfill space. Wood left to decompose in a landfill also releases methane, which is 21 times worse as a greenhouse gas than carbon dioxide, Irving said. Wood burned at the plant does not release methane.

Thomas Walker, study team leader for the Manomet report, and Christopher Recchia, a contributor to the report from the Biomass Energy Resource Center, both said in a recent interview on Vermont Public Radio that many news stories in the past week stated incorrectly that the Manomet study implied biomass is worse for the environment over time than coal.

"It's exactly wrong," Recchia said during the interview. The report shows that over time, wood fuel will produce a greater carbon dividend than fossil fuels, it just takes longer than most people previously thought.

The Manomet study only looked at carbon emissions, Recchia noted.

"Coal, of course, emits mercury, arsenic and sulfur dioxides, which wood does not," Recchia said. "That's a really critical distinction."

The McNeil plant employs four foresters who inspect each harvesting operation once a week to make sure it meets certain standards, such as following soil-erosion practices and protecting wildlife, wetlands and aesthetic qualities of hiking trails. But they don't replant the forests.

"If you harvest it properly," Irving said, "nature can replant it better than we can."