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Potential Grows for Biomass Energy

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By Erica Gies

SAN FRANCISCO — Woody biomass provides just 0.94 percent of all U.S. energy now, supplying the equivalent of 3.5 million American homes. But Bob Cleaves, president of the Biomass Power Association, a group in Portland, Maine, that represents about 80 plant-burning incinerators in 16 states, says available raw material would allow the industry to double its output. New incinerators are already being planned in many states.

The idea of homegrown, renewable energy, is appealing. It would qualify for tax credits under the American Recovery and Reinvestment Act of 2009 and could benefit from support for renewables in the climate bill now going through the Senate.

But many environmentalists are worried. Some, like Chris Matera, founder of Massachusetts Forest Watch, warn that biomass incineration could cause major environmental damage, including the clear cutting of forests and the use of vast quantities of water for cooling. They also say that its combustion emissions are worse than coal's — a serious charge because in both House and Senate versions of the climate bill, the technology falls into a "biomass loophole." Categorized as a renewable energy source, biomass would be exonerated from emission caps.

Proponents say that biomass fuel from forests is usually waste wood, the material left over after harvesting for more profitable lumber and paper pulp.

The idea that increased biomass power generation could lead to clear cutting "sounds like hyperventilation to me," said Ian A. Bowles, secretary of energy and environmental affairs for the state of Massachusetts. "We're not going to manage our forests to meet biomass power demands."

"It is absolutely uneconomic to cut a tree down to make biopower," said Mr. Cleaves of the incinerators' group.

Biomass plants are typically small, generating less than 50 megawatts, said Jasen Stock, executive director of the New Hampshire Timberland Owners Association, because it is not cost effective to drive wood long distances to the plant. "The concern that it's going to result in a moonscape around that biomass plant is really unfounded," he said.

But environmental advocates remain skeptical. "The numbers just don't add up," said Mary S. Booth, the senior scientist at Massachusetts Environmental Energy Alliance, a group that opposes wood-burning power plants.

For example, a 2008 report for the Massachusetts Division of Energy Resources and the Massachusetts Department of Conservation and Recreation said that four planned biomass incinerators in the state would require an estimated 1.4 million “green,” or undried, tons of biomass a year to fuel 165 megawatts of generation. A partial harvest — not clear-cutting — from forests 70 to 100 years old could net approximately 50 green tons an acre, the report said and it estimated that the haul from public forest lands and willing private landowners could be about one million green tons a year.

Ms. Booth said this plan would almost double the amount of wood harvested in current cutting practices and would expand the area harvested as well. A healthy ecosystem requires some tree waste to decompose into the soil to provide vital nutrients and forage opportunities for insects, birds, and some mammals. She and other environmental advocates question whether this level of extraction is sustainable.

Although timber managers emphasize the use of waste wood, all say that small or crooked trees with little commercial value could be used for biomass. The conditional approval report for a 50-megawatt plant in Russell, Massachusetts, says that operators expect to buy 250,000 to 350,000 green tons a year of “whole tree fuel.”

Some forestry experts say that biomass can be sustainable — if programs are small scale and carefully managed. Laurie Wayburn, president of the Pacific Forest Trust, a nonprofit organization in California, said it was possible to manage forests sustainably for both the natural ecosystem services they provide — like water storage and cleaning, biodiversity, and habitat — and for such products as timber, paper pulp and biomass.

She said forests need human management at this point because people have already distressed them so much with their activities. “Walking away and pretending that no management is a solution is a recipe for disaster.”

But Mr. Matera, of Massachusetts Forest Watch, says the idea that “‘we have to log the forest for forest health’ is nonsense. The forest doesn’t need us; we need the forest. It’s a sort of anthropocentric worldview to rationalize all this logging.”

Still, enhancing the economic base for forest land helps retain it as forest, said Eric W. Kingsley, vice president of Innovative Natural Resource Solutions, a company that works on forest-based economic development.

“Biomass adds a new potential market to land owners, adding value to timber — and to timber-producing land,” Mr. Kingsley said. “That allows land owners to leave the forest taking up carbon, providing wildlife habitat, recreation opportunities, clean air, clean water; the hundreds of things we rely on forests for.”

In addition to the argument over logging, ecologists worry about water use for cooling. For example, the Russell plant would extract as much as 885,000 gallons, or 3.35 million liters, a day from the nearby Westfield River, of which 85 percent would be lost to

evaporation. Such losses are typical of biomass plants, said Margaret E. Sheehan, a lawyer who represents opponents of the Russell plant.

Burning biomass also releases emissions. Like other renewable energy technologies, however, it is widely presumed to be carbon neutral. The carbon absorbed in growing plants is considered to offset the releases.

Still, that equivalence “is purely hypothetical,” said Ms. Booth, the Massachusetts environmental scientist. New trees take time to grow, and scientists from the Intergovernmental Panel on Climate Change say time for reducing greenhouse gas emissions is short — perhaps as short as 40 years.

“Our position is that we’re in a climate crisis now,” Ms. Sheehan said. “It only takes a minute to burn a 70-year-old tree, and it takes 70 years to grow it back.”

Moreover, figures derived from government and power plant data show that burning woody biomass releases 1.5 times as much carbon dioxide per megawatt-hour generated as coal, according to the Massachusetts Environmental Energy Alliance.

These emissions would escape regulation under cap proposals in the climate bill. “It’s a critical problem that this area isn’t regulated under the cap,” said Nathanael Greene, director of renewable energy policy at the Natural Resources Defense Council. “In the long run, as our pressure on fossil fuel emissions gets tighter and tighter, the incentive to shift to the unregulated source of energy, the biomass, will get higher and higher.”