Turning forests into fuel: New report outlines promise and limits of biomass energy in the Northeast

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This is an aerial view of logging activity in the Adirondack region of New York state. Credit: Charles Canham

Forest biomass could replace as much as one quarter of the liquid fossil fuel now being used for industrial and commercial heating in the Northeastern United States. That's according to a new report released today by the Cary Institute of Ecosystem Studies.

But the report also has sharp caveats: The potential for forest biomass varies widely within the region, and forest resources must be carefully managed to protect the other important services and goods they provide. Under the right circumstances, however, the report found that forest biomass can provide a domestic energy resource, create local jobs, and provide incentives to forest owners.

"In targeted applications, the heat generated by locally-grown biomass can reduce dependence on fossil fuels and support local economies," said Dr. Charles D. Canham, a forest ecologist at the Cary Institute and co-author of the report. "But each forested landscape is different, and regional variation in forest conditions and energy infrastructure means there is no one-size-fits-all solution."

The report analyzed U.S.D.A. Forest Service Forest data from Connecticut, Maine, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island, and Vermont.

It found that using forest biomass for heat in the region was far more effective in replacing liquid fossil fuels than converting it to cellulosic ethanol for road transport. Biomass burned in combined heat and power plants reduced fossil fuel use more than five times more effectively than substituting gasoline with cellulosic ethanol.

Under best-case scenarios, however, the energy generated sustainably from forest biomass in the Northeast could replace only 1.4% of the region's total fossil fuel energy. But for some states, biomass energy could be much more compelling when replacing fossil fuel use in certain sectors.

"Maine and New Hampshire show the greatest potential for forest biomass energy," said Dr. Thomas Buchholz, a researcher at the University of Vermont's Carbon Dynamics Lab and co-author on the report. "Our study found that New Hampshire could replace as much as 84 percent of its liquid fossil fuel dependence in the industrial and commercial heating sector, and Maine could replace 49 percent of its liquid fossil fuel dependence in the home-heating sector."

But the report cautioned that utmost care must be observed in all parts of the region.

"There is a misconception that Northeastern forestland is a vast, untapped resource," Canham commented. "This is simply not true. Unrealistic

growth in biomass energy facilities could lead to serious degradation of forest resources. While forest biomass is part of the renewable energy toolkit, it is by no means a panacea."

"Forest biomass can be an important element of a low-carbon energy future," added contributing author Dr. Steven Hamburg of Environmental Defense Fund. "But we'll need ongoing scientific oversight to ensure it is done sustainably."

Provided by Cary Institute of Ecosystem Studies