

Massachusetts Study Highlights Issues in Biomass and Carbon Policy

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Massachusetts was one of the first states to enact a Renewable Portfolio Standard (RPS) that requires electric utilities to supply a certain percentage of their electricity from renewable sources by a certain date. In addition to wind and solar energy projects, Massachusetts has invested in the development of three proposed wood biomass power plants as part of the effort to reach its RPS targets. Massachusetts' Global Warming Solutions Act of 2008 also aims for the state to reduce its greenhouse gas (GHG) emissions by 80 percent below 1990 levels by 2050.

In large part because of these dual policy goals, the state has interpreted the "sustainability requirements for eligible biomass," that are included in the state's RPS legislation to include both forest-management and lifecycle GHG emissions components. As a result, after increased concern over proposals to construct three (30 - 50 MW) biomass power plants in western Massachusetts, the state suspended wood biomass as a compliance option under their RPS until a study of the lifecycle GHG emissions associated with different bioenergy options was completed. The state also called for the study to determine what additional safeguards may be needed to ensure that any new bioenergy capacity in Massachusetts could operate in a manner that is consistent with the sustainable management of Massachusetts' forests.

Led by the Manomet Center for Conservation Sciences, the study team also included the Pinchot Institute, the Biomass Energy Resource Center, the Forest Guild, and several independent natural resource economists. The Biomass Sustainability and Carbon Policy Study included several interrelated areas of inquiry:

1. How much wood is available from forests to support biomass energy development in Massachusetts?

2. What are the potential ecological impacts of increased biomass harvests in Massachusetts, and what if any policies are needed to ensure that these harvests are ecologically sustainable?
3. What are the atmospheric GHG implications of shifting energy production from fossil fuel sources to forest biomass?

Key findings from the study include:

- The amount of wood biomass that could be sustainably supplied for renewable energy is constrained by economic and social factors than by ecological factors.

“...when wood supply constraints, lifecycle GHG emissions, forest sustainability, and other public concerns are considered, the findings of this study indicate that at least in Massachusetts some biomass energy options may fit better than others.”

- The “carbon-neutrality” of biomass energy in Massachusetts was determined to be a much more complex issue than typically perceived. It was determined that over time wood energy could lead to lower atmospheric GHG levels and that the length of time before such climate benefits could be realized varied on a number of factors. While emissions from burning wood would initially be higher than from fossil fuels, regrowing forests sequesters carbon, a process that eventually can yield GHG levels lower than would have resulted from continued burning of fossil fuels.

- The degree to which a particular bioenergy system can realistically be described as “carbon-neutral” depends on the interaction of a number of forest system variables with a number of energy system variables. These variables include the bioenergy technology employed, the fossil fuel technology replaced, the fossil fuel replaced, and the forest management characteristics of biomass harvest areas both before and after the harvest and combustion of biomass.

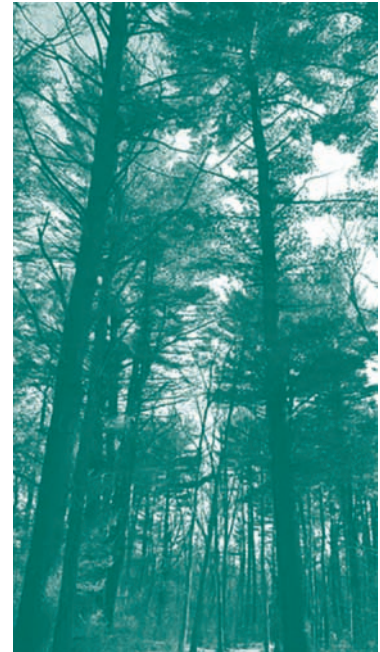
- Higher efficiency technologies (i.e., thermal and combined heat and power technologies) were deter-

mined to generally reduce the time period in which GHG emissions from biomass combustion were re-sequestered in the growth of new forests, which resulted in climate change benefits being realized sooner than other technologies.

- When it comes to biomass, RPS mandates may conflict with GHG emission reduction policies, therefore an accurate carbon accounting framework is important to inform policy and energy project proposals. Massachusetts' inclusion of high-efficiency (i.e., both the electricity and thermal output of combined heat and power) technologies as a compliance option under the state's RPS may promote renewable energy projects that help the state meet both its renewable energy goals and climate change mitigation goals.

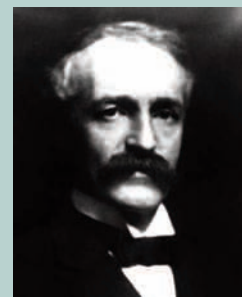
The premise and findings of this study suggest that in Massachusetts bioenergy can play an important role in renewable energy and climate change mitigation. Still, when wood supply constraints, lifecycle GHG emissions, forest sustainability, and other public concerns are considered, the findings of this study indicate that

at least in Massachusetts some biomass energy options may fit better than others. Ensuring the sustainability of forest-based biomass energy is complex and requires an evaluation of a number of interlocked social, economic, and environmental values that society has come to expect from our forest and energy systems. As interest and investment in forest-based biomass energy continues to increase, scientific analyses and civil debate over the merits of policy approaches will continue to be an integral aspect of the public policy process. ■



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