



Massachusetts Chapter

Policy On Forest and Woody Biomass Fuels, December 2009

Background

The Sierra Club opposes the unsustainable exploitation of forest ecosystems. The Sierra Club has significant concerns over the production of energy from forest or woody biomass, including the inefficiency of utility-scale wood-burning biomass energy production, the resultant operational CO₂ emissions, and the associated impacts on forest ecosystems, air and water quality, and public health. Claims of “carbon neutrality” by biomass and industry proponents rely on outdated information and questionable assumptions.¹ The Sierra Club is not confident that significant potential for biomass power generation is possible without compromising soil and forest health, nor are we confident that regulatory frameworks exist or can be developed to prevent the unsustainable exploitation of forest eco-systems for utility-scale biomass power generation. Regardless of the scale of a facility, it is the scale of harvesting that is most relevant. The impacts of multiple small-scale facilities could easily exceed that of larger facilities. Neither scenario is a desirable outcome.

Whereas:

- Native forests are presently the largest source of fuel for projects defined as biomass.
- Harvesting existing forests for electricity adds net carbon to the atmosphere.²
- There is little likelihood that energy resources provided by forest biomass can be increased sustainably.
- Leading climate change scientists call for immediate carbon dioxide reductions of 2 to 3 percent per year to avert the worst impacts of global climate change.
- A net carbon dioxide increase at this time from biomass harvesting and burning may accelerate climate change impacts and make it difficult or impossible to meet CO₂ reduction targets of 80% by 2050.
- *A typical Utility-Scale electricity-only power-plant using forest or woody biomass as fuel:*
 - Generates electricity at less than 25% efficiency, or less than a typical coal-fired power plant.
 - Emits 1.5 times as much operational CO₂ than coal per unit of energy generated.
 - Emits 3 to 4 times as much operational CO₂ than natural gas per unit of energy generated.
 - Has the potential for profound impacts on local and regional air and water quality.
 - Burns over one ton of wood per minute, requiring 13,000 tons of green biomass to generate one megawatt of biomass power for one year, or 35 tons of green wood per megawatt per day.³
 - With unsustainable biomass harvesting and consumption, can reduce the ability of remaining and regenerating forest eco-systems to sequester carbon and destroy important natural habitats by reducing the amount of nutrients and woody debris available for recycling in the forest.

Be it resolved that the Massachusetts Chapter of the Sierra Club hereby:

- Opposes biomass energy generation processes which contribute to the destruction of existing forests.
- Opposes utility-scale electricity-generating biomass facilities whose fuel consists of woody biomass extracted from forest ecosystems.
- Opposes regulatory classification of utility-scale woody biomass as “renewable” or “carbon-neutral”.
- Encourages governmental and regulatory entities to remove eligibility for *Renewable Energy Credits* and all similar incentives or subsidies for utility-scale wood-burning biomass facilities.
- Encourages full environmental review of all proposed biomass facilities regardless of scale.
- Will review on a site-specific basis small-scale combined heat and power biomass-to-energy projects which avoid inefficient transportation of fuel stocks by providing distributed power directly to end users and on lands where they are carefully monitored and designed as part of a sustainable system similar to that required for Forest Stewardship Council certification.

Approved unanimously by the Massachusetts Chapter Executive Committee, December 20, 2009. *The term “biomass” in this policy refers to forest/woody biomass and does not apply to agricultural waste as fuel, algae crops, or farm crops which may include switch grass, woody herbaceous crops, and short rotation woody crops such as willow. The Sierra Club opposes burning of construction and demolition debris as biomass fuel which is further covered in separate Chapter policies. For a complete background on this policy and biomass issues please visit www.sierraclubmass.org/biomass.html.*

¹ Searchinger, Timothy D. et. al., Fixing a Critical Climate Accounting Error, *Science* 326, 527-528 (2009).

² *ibid*

³ Innovative Natural Resource Solutions, 2007. Biomass Availability Analysis Report prepared for the Massachusetts Division of Energy Resources.



December 22, 2009

Senator Anthony W. Petrucelli, Chair
Representative William M. Straus, Chair
Joint Committee on Environment, Natural Resources & Agriculture
State House, Boston, MA 02133

Re: Biomass – House Bill 759 and Overall Regulatory and Policy Challenges

Dear Chairman Petrucelli, Chairman Straus, and members of the Committee:

On behalf of the Sierra Club, I wish to follow up with further information on our concerns regarding biomass facilities in the Commonwealth. We want to thank the committee for your interest and attention to this important issue. The Sierra Club is conducting a legal analysis of the complex challenges facing the commonwealth in an effort to help avoid devastating environmental impacts from timber harvesting for the purpose of biomass-fueled power generation. This analysis will be completed in January 2010, so this letter should serve as a preliminary introduction to our concerns. The Massachusetts Sierra Club's newly adopted policy on biomass is attached to this document.

Overview

The Sierra Club applauds the legislature and the administration for its vision and leadership in passing the *Green Communities Act*, the *Global Warming Solutions Act*, and for joining the *Regional Greenhouse Gas Initiative*. However, as noted at the recent hearing, we believe the environmental community and the legislature missed key opportunities early on to question the concepts of biomass energy, including the inefficiency of utility-scale wood-burning biomass energy production, the resultant operational CO2 emissions, and the associated impacts on forest ecosystems, air and water quality, and public health. Unfortunately, the Massachusetts Environmental Policy Act (MEPA) has failed to provide the necessary oversight for proposed biomass facilities.

We believe that House Bill 759, *An Act Relative To Biomass Combustion Facilities*, can be expanded and amended to address the many biomass concerns that have arisen, albeit as an unintended consequence of well-meaning actions to promote renewable energy and curb global warming. It is in the best interest of both the environmental and business community to act quickly. The rush to build several utility-scale projects in the commonwealth is largely a result of regulatory incentives and loopholes combined with “green energy” subsidies for energy speculators. Should these facilities proceed under the current paradigm, significant taxpayer dollars will go to large-scale devastation of forest ecosystems, as well as accelerating the impacts of global climate change. We believe taxpayer *and* investor dollars are better spent on other truly renewable and sustainable energy solutions.

Biomass – Renewable, Sustainable, Carbon Neutral?

Biomass is considered by many to be a renewable source of energy that does not aggravate global warming because the carbon involved is functioning in a shorter cycle than fossil fuels, and regrowth can theoretically balance the emissions. However, unsustainable land use practices may release soil carbon to the atmosphere. Accelerated and poorly-managed harvesting of forests and crops as fuel accompanied by the conversion of natural ecosystems to fuel farms will increase global warming and degrade the environment. Harvesting, transportation and processing of fuel stocks is highly energy intensive. These are but a few of the many “externalities” of biomass that are typically not considered in “environmentally friendly” or “carbon neutral” assertions of biomass enthusiasts. It is important to

make a distinction between what becomes classified as “renewable” or “green” and what is actually “sustainable” from an environmental perspective.

The Sierra Club believes that biomass projects can be *theoretically* sustainable, but that most biomass projects are *not*. Native forests are presently the largest proposed source of fuel for projects defined as biomass. There is little likelihood that energy resources provided by forest biomass can be increased sustainably. We are not confident that massive new biomass energy resources are available without risking soil and forest health, given the lack of commitment by governments and industry to the preservation, restoration, and conservation of natural resources, and the extended timescale necessary to mitigate impacts. Even with such commitments, we believe state and federal governments should instead allocate scarce resources to promote truly renewable and environmentally beneficial solutions, not questionable power generation that involves burning trees or construction and demolition debris.

We are concerned that the levels and scale of wood harvesting required for even a single utility-scale biomass energy facility, such as that proposed in Russell, could dramatically alter the landscape of the commonwealth. A typical plant requires 13,000 tons of green biomass to generate one megawatt of biomass power for one year, or 35 tons of green wood per megawatt per day.¹ In addition, regardless of the scale of a facility, it is the scale of harvesting that is most relevant. The impacts of multiple small-scale facilities could easily exceed that of larger facilities. Neither scenario is a desirable outcome.

We are also concerned that a “carbon pulse” of operational CO₂ emissions from biomass will exceed that of even coal per unit of energy generated, at a time when leading climate scientists are calling for immediate carbon dioxide reductions of 2 to 3 percent per year to avert the worst impacts of global climate change. Quite simply, harvesting existing forests for electricity adds net carbon to the atmosphere², and great quantities of CO₂ would be released *now*. A net CO₂ increase at this time from biomass burning may accelerate climate change and make it difficult or impossible to meet CO₂ reduction targets of 80% by 2050. Under the current regulatory framework, governments and the energy sector are playing a clever game where CO₂ emissions would not be counted by regulatory entities, even as they are being pumped into the natural environment at ever increasing rates.

Furthermore, the theory that new forests absorb carbon faster than older forests has been challenged by multiple studies, including studies in New England.³ For those that have proposed using significant “residues” from existing forest industries, a recent analysis tool provided by the *National Renewable Energy Laboratory* indicates these residues in Massachusetts would supply a mere 6.35 MW of biomass power fueled by the amount of wood that could be generated in the five counties of western Massachusetts.⁴ There is already more than 100 MW of biomass proposed in the commonwealth. Supplies will fall short of expectations, and the remaining fuel stock would therefore likely come from whole-tree harvesting, C&D (see below), or other sources with significant environmental impacts and which the Sierra Club opposes. Many foresters and scientists agree that biomass fuel consumption reduces the ability of remaining and regenerating forest eco-systems to sequester carbon and destroys important natural habitats by reducing the amount of nutrients and woody debris available for recycling in the forest. These residues are better left in place, rather than burnt for power generation.

Construction and Demolition Waste (C&D)

In addition to trees and other forest residues, construction and demolition waste is proposed as fuel for biomass facilities, either to be used exclusively or in combination with forest biomass. Projects based on construction and demolition waste are often treated similarly to biomass in regulatory frameworks, and efforts continue to relax standards for burning such debris. There are proposals to

¹ Innovative Natural Resource Solutions, 2007. Biomass Availability Analysis Report, Massachusetts Division of Energy Resources.

² *ibid*

³ Keeton, W., Kraft, C., and Warren, D. 2007. Mature and old-growth riparian forests: structure, dynamics, and effects on Adirondack stream habitats. *Ecological Applications*. 17(3):852-868, and Munger, B. and Wofsy, S. Unpubl. data, Harvard Forest

⁴ Massachusetts Environmental Energy Alliance, Correspondence to EOEEA Secretary Ian Bowles, November 22, 2009.

<http://massenvironmentalenergy.org/docs/MEEA%20to%20Sec%20Bowles%20on%20harvest%20sustainability%20Nov%2022%2009.pdf>

have C&D burning classified as a “beneficial use” and/or “recycling”. But construction and demolition debris is neither clean nor beneficial for air quality or CO2 emissions. Even after material sorting, plants burning C&D emit particulates and large amounts of lead, arsenic, mercury, dioxins, and other hazardous air pollutants. NH has banned the burning of C&D based on the overwhelming public health impacts. When combined with incentives to burn multiple fuel stocks, including forest byproducts or municipal tree trimmings, you can quickly create strong incentives for plant managers to use unsustainable or contaminated fuel if the intended supply runs short, as noted above.

Manomet Biomass Study and DOER Suspension of REC’s

We commend the Executive Office of Energy and Environmental Affairs for suspending the application for *Renewable Energy Credits* for biomass plants and commissioning a study on the sustainability of biomass. However, we do have some concern over further delay pending the outcome of yet another study. There is already substantive science supporting the removal of REC’s and other incentives for biomass, and it is unclear what new information the Manomet study will actually develop. In the interim, facilities are proceeding apace with other permits and applications, as well as continuing to receive subsidies and incentives from other sources. Some proposed facilities seem rather unconcerned with the apparent delays or potential elimination of subsidies or credits. The Sierra Club, and many others, will be reviewing this study closely, and we will keep the committee apprised of our concerns. It is our hope that some positive actions can take place before the study is complete.

Conclusion / Preliminary Recommendations

The Sierra Club believes our nation’s path to a truly renewable energy future should not be paved with outdated technologies and bad ideas. There are cleaner, better, and faster solutions to meet our energy needs, including wind, solar, and tidal energy, and the tremendous strides to be made in the efficiency sector. As the Chapter’s newly adopted biomass policy states, we oppose the permitting and construction of utility-scale biomass power generation in the commonwealth. This includes facilities that would burn either forest biomass or construction and demolition waste. We are asking that the legislature act quickly to move the commonwealth’s energy agenda away from burning trees or C&D for utility-scale electricity power generation. As noted, we will follow up shortly with technical recommendations on how to amend House Bill 759 to address loopholes in regulations, statutes, regional agreements, and administrative initiatives.

It is not too late to ask the important questions about biomass, but correcting the course will require swift action by the legislature and the administration. Some of the aforementioned acts and initiatives will need to be corrected, while others may provide ideal mechanisms to address concerns. The actions initiated by the administration to suspend *Renewable Energy Credits* for biomass and to review the beneficial use determination of C&D has created a unique window for the legislature to act. We look forward to working closely with you and the members of the committee and we are confident that Massachusetts, with your leadership, can set an example for our nation in developing sensible solutions to meet our energy needs and challenges.

Very truly yours,



James Bryan McCaffrey
Director, Massachusetts Sierra Club

Attachments: *Massachusetts Sierra Club Policy on Forest and Woody Biomass Fuels, December 2009*

Cc: Secretary Ian Bowles, EOEAA
Representative Peter V. Kocot
Senator Michael W. Morrissey, Chair, Telecommunication, Utilities & Energy Committee
Representative Barry R. Finegold, Chair, Telecommunication, Utilities & Energy Committee