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Biomass Energy Resource Center

BIOMASS ENERGY:
BERC Forest Carbon Management Policy

Realizing the potential of forest biomass energy to produce a low or no-carbon source of renewable energy depends on several factors:

- accurate accounting of carbon emissions
- assessment of the sustainability of biomass sources
- harvesting regimes and forest management practices that sustain the carbon balance and other ecosystem values over time
- maximized efficiency
- adequate infrastructure and market capacity

Understanding of the carbon implications of biomass energy is changing. Established national and international policy (via the US Environmental Protection Agency and the Intergovernmental Panel on Climate Change) currently considers energy produced from biomass to be "carbon-neutral" because the carbon released is considered to be part of the short-term (biogenic) CO_2 cycle of the biosphere. By comparison, fossil fuels such as coal, oil, or natural gas are produced in a geologic timeframe and when extracted and burned for energy, result in a net increase in atmospheric carbon.

There is increasing understanding in the scientific and public policy communities, however, that replacing fossil fuels with bioenergy only supports a reduction in carbon emissions and the net greenhouse gas (GHG) balance if: (1) the carbon released during biomass harvesting and combustion is re-sequestered by new forest growth in approximately the same timeframe it took to grow the original stock; or (2) biomass energy is generated using wood residues that are the by-product of producing higher-value products. It is important to note that the science of long-term carbon balance in terrestrial ecosystems is imprecise and continues to develop. Consequently, sequestration policy should allow for a significant margin of error and err on the side of caution.

To achieve the potential of biomass energy to reduce carbon emissions and net GHG levels, the following issues must be addressed:

Forest Management and Net Changes in Carbon Stocks. Existing forest management policy and practice (including regulations and voluntary measures) need to ensure that increased removals for biomass energy maintain long-term forest health and ensure a sustainable supply of woody biomass for all uses. Forest management standards and guidelines must also ensure carbon re-sequestration over time (for all forest uses, not just removals for biomass energy feedstocks).

Time. The carbon impacts of biomass energy are inextricably linked to time. Carbon is released when biomass is burned for energy and it takes a certain amount of time to re-sequester this carbon. Consequently, forest management practices that sustain long-term forest health and support re-sequestration of forest carbon are essential to this equation. It will also take time to solve global climate issues—climate change is not a short-term problem with short-term solutions, so using forests to help provide low-carbon energy based on assumptions of long-term forest management is an appropriate and viable strategy in the gradual transformation of our energy infrastructure.

Land-Use Change. For forest biomass energy to be carbon-beneficial, feedstock harvesting cannot result in net land-use changes resulting in a loss of forest cover, land conversion to non-forest uses, or management regimes that deplete carbon stocks over time. While to date, the biomass market is rarely the driver for forest management decisions, harvesting activities or land-use change, it is important to note that there is a concern that this could shift as market pressures develop. In addition, the spatial aspect of maintaining global forest carbon sinks are very complex in a globalized market where landowners' decisions can affect how well forest carbon is maintained in other parts of the world.

Another critically important way that biomass energy can support the maintenance of forest cover and global carbon sinks is by providing an economically viable market for low-grade wood. This can help landowners pay for forest management activities and keep forests as forests rather than have unprofitable holdings lost to development, resulting in significant and permanent loss of carbon stores.

Efficiency and Emissions. Energy derived from biomass should minimize emissions of carbon (and other pollutants) through maximizing the overall efficiency of combustion technologies, thereby realizing the most energy per unit of carbon burned. Using biomass for energy, heating, cooling, and cogeneration are the uses that are most efficient in reducing GHG. To date, national renewable energy policies have ignored these relative efficiencies and incentivized uses independent of overall efficiency and net carbon emissions. This approach could overtax the energy potential of our country's wood resource while diminishing capacity to help lower net carbon emissions.

Fossil Fuel Offsets. Where biomass energy is used as a substitute for fossil fuels, it offsets additive geologic carbon emissions. If forest management and harvesting regimes maintain carbon stocks and support re-sequestration over time, biomass energy can also be low-carbon or potentially carbon-neutral with respect to the biogenic carbon emissions. To accurately assess carbon offsets associated with substituting biomass energy for fossil energy, actual carbon flows for different biomass technologies based on efficiency must be analyzed and compared to carbon emissions for fossil energy including oil, coal, and natural gas.

Public Policy Recommendations for Carbon-Beneficial Biomass Energy

1. Support and promote a carbon management system in which everyone is responsible for their own carbon emissions and credited with their own carbon sequestration efforts. Such a system would reward landowners, public and private, for maintaining the forest ecosystem, just as they would be responsible for any removals.
2. Develop an "outcome-based" National Energy Policy at the state and federal levels that would deliver on core clean energy objectives and give priority to energy options (biomass and others) that maximize efficiency and minimize carbon emissions.
   - A Renewable Energy Standard (comparable to the existing Renewable Fuels Standard and proposed Renewable Electricity Standard)
   - National and state carbon policies and greenhouse gas emissions programs that support the most efficient uses of biomass
   - Federal and state incentives, grants, and loans to advance the utilization of high-efficiency biomass thermal and combined heat and power (CHP) systems
   - Renewable Portfolio Standards that include thermal energy, the provision of renewable energy credits for thermal applications, and the promotion of efficient and sustainable use of biomass
3. Fund and conduct accurate and ongoing assessments of sustainable biomass energy supply.
4. Support biomass harvesting guidelines, sustainable forest management, and procurement standards to ensure a sustainable supply chain that maintains carbon stocks for timber and other biomass harvesting activities.
5. Under any carbon credit system, ensure that credits reflect net changes in carbon stocks, emissions of CO_2 and other greenhouse gases, and leakage emissions resulting from changes in forest cover or land use.
6. Establish consistent federal and state air-emission standards and regulations for biomass energy to minimize emissions and meet stringent public health and air-quality standards.
7. Support forest conservation efforts, provide offset credits that guard against leakage and other incentives for increased carbon sequestration and storage, and address forest adaptation due to changing climate.

Adopted by the BERC board of directors on December 6, 2010.