



Utilization of Forest Biomass for Energy

Originally adopted by the SAF Council on October 19, 2005. This position was revised and adopted by SAF Council on March 3, 2011. It will expire on March 3, 2017 unless it is further extended by the SAF Council.

Position

The Society of American Foresters (SAF) supports policies that promote the sustainable utilization of forest biomass for energy as well as existing uses. In western states, expanded opportunities to increase utilization of forest biomass can help reduce the accumulation of hazardous fuels and restore healthy forest conditions, particularly on public lands. Increased utilization of forest biomass can also improve forest conditions in eastern and southern states, where additional markets for low market-value and small-diameter trees will enable forest managers to improve the quality of hardwood forests and reduce overstocking in coniferous forests. Utilizing additional forest biomass will also help improve the nation's energy security by providing an abundant, renewable fuel resource as a substitute for imported fossil fuels, and through the product and energy substitution effect reduce fossil fuel-based carbon-dioxide emissions. SAF supports science-based energy and environmental policies that sustain the long-term health of forest ecosystems, facilitate siting and permitting of biomass-using facilities, and encourage long-term agreements to supply forest biomass in dependable quantities sufficient to attract investment in both processing facilities and delivery systems.

Issue

Economic, capacity, public policy, and other barriers discourage investment in biomass-using facilities. These include complex air quality regulations that fail to recognize the emissions benefits of biomass facilities, complicated facility siting and permitting processes, uncertainty in securing long-term power purchase agreements, inequitable classification of forest biomass in renewable energy portfolio policies, and limitations on long-term contracts for production and delivery of forest biomass from federal lands. Policies often make it difficult to remove hazardous fuels on federal lands and to develop contracts that are economically viable for private sector contractors. Many localities lack economically viable markets or sufficient utilization capacity to utilize low-quality or small-diameter trees that are designated for removal during thinning or stand improvement harvests.

Background

Forest biomass currently provides about 4% of the United States' total energy needs. Most of this energy generation is accomplished by direct combustion to provide steam for heating and electricity generation (US EIA 2011). The use of forest biomass, which includes logging residues, urban wood wastes, fuel treatment of forest lands, traditional fuelwood sources, and forest products manufacturing residues, for energy generation provides potential opportunities to use large amounts of material. In addition, tree genetic improvement programs and the development of woody crops have the potential to increase the volume of forest biomass available for bioenergy and traditional products, and to address price competition concerns between users of forest biomass for bioenergy and traditional market participants.

Estimates of how much forest biomass can be produced annually on a sustained basis vary. Large quantities of forest biomass are removed to reduce stand density in overstocked stands. In addition to producing bioenergy, this material could potentially be used for a variety of forest products—flooring, paneling, fencing, posts, pulp, and composting (LeVan-Green and Livingston 2001). Utilization of forest biomass for energy and products also usually provides atmospheric carbon benefits through the substitution effect (Malmsheimer et al. 2011).

While opportunities to use forest biomass exist, a larger infrastructure is required to utilize the additional volumes of material generated from expanded fuel reduction, forest health treatments, forest stand improvement, and other projects. Significant barriers exist to the increased utilization of the smaller diameter forest biomass. Some of these barriers are interrelated:

- *Long-Term Guaranteed Supply.* The ability of the Forest Service and Bureau of Land Management to provide a guaranteed supply of forest biomass has been very uncertain due to appeals and legal challenges of federal land management decisions. Lending institutions and wood products companies are generally unwilling to invest in biomass harvest and transport equipment or processing facilities without a guarantee of a dependable long-term supply of forest biomass (GAO 2005).
- *Energy Policies' Differing Definitions of Renewable Biomass.* Differing and often conflicting definitions of renewable biomass in current federal energy policies hinders policy implementation and the development of biomass markets. For example, the Energy Policy Act of 2005 disallowed the use of federal woody biomass for the renewable energy credit. In contrast, Section 203 of the Healthy Forests Restoration Act of 2003 (PL 108-148, codified at 16 US Code Section 6531) provided authority for the Biomass Commercial Utilization Grants Program, which emphasizes the use of woody biomass especially from wildfire-affected areas in the wildland–urban interface. A universal definition of renewable biomass that includes renewable, sustainable forest biomass—and does not confound this definition by attempting to address other policy goals—would promote the development of sustainable energy and environmental policies on appropriate lands (Malmsheimer et al. 2011).
- *Lack of Capacity.* In many parts of the country, especially in the western states, the basic elements that sustained the wood products industry have been substantially reduced or eliminated with the reduction in federal timber sales that occurred during the 1990s (Skog et al. 2008). Experienced contractors have gone out of business and basic harvesting equipment is not available in many locations. People skilled in harvesting and manufacturing forest products have moved to other locations or begun new careers. Many

pulp and paper and lumber and plywood mills have closed, resulting in fewer processing options and greater hauling distances for all forest products, including forest biomass.

- *Accessibility of Material.* Much of the potentially available forest biomass in the western US is located in remote areas where there are a limited number of roads or originates on steep slopes that require specialized and costly harvesting systems. Most forest roads were not designed to accommodate longer chip-hauling vehicles. Throughout the US, material in and near urban-forest interface areas can be difficult to access because of local conditions and ordinances, and because of the large number of small owners that make up a substantial part of the supply base in most regions. Operational scale is a significant factor in all regions because it arises on both the supply and demand side. In particular, fragmentation of supply can provide a two-fold limitation to accessibility; directly because of additional costs of procurement from a large number of small producers, and/or indirectly because of how supply/demand dynamics influence the ability to develop facilities of sufficient size to be economically viable (Becker et al. 2010).
- *Costs and Profits.* A major barrier to the increased use of forest biomass is financial. Each of the above barriers contributes to the increased cost of biomass delivered to a processing facility. Compared to larger-diameter sawtimber, forest biomass produced from small-diameter trees is more expensive to harvest, transport, process, and store and yields lower end-product returns (GAO 2005; Nichols et al. 2008).

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