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Forest Biomass Supply, Sustainability and Carbon Policy

A Policy Statement approved by Resolution
by the National Association of State Foresters

The National Association of State Foresters (NASF) views forests as a strategic national resource of vital importance to meeting the nation's economic, environmental, and energy needs. Biomass from the nation's public and private forests can and must be part of any solution to meeting the nation's renewable energy goals, particularly in regions where solar, wind, and other renewable resources are less prevalent.ⁱ

NASF members, as natural resource professionals and directors of forestry agencies in all U.S. states and territories, have a special responsibility and commitment to ensuring the sustainability of the forest resource. As the nation looks to expand federal renewable energy mandates, NASF offers the following perspective on three important considerations including:

- The green house gas implications of wood-based bioenergy development
- Forest biomass supplies
- The sustainable removal of biomass from forests

Section I. Greenhouse Gases and Wood-based Bioenergy Development

Sustainably managed forests make a significant contribution to reducing greenhouse gas levels whereas the combustion of fossil fuels releases geologically sequestered carbon that has been stored for centuries and adds to the total amount of carbon in active circulation.ⁱⁱ The use of renewable forest biomass for energy may have short-term emissions, but over the long-term does not increase carbon in the atmosphere and has significant carbon benefits over non-renewable energy sources such as fossil fuels.

The carbon cycle is considered in-balance (i.e. carbon is neither added nor removed from the atmosphere) when biomass is re-grown at the same rate it is consumed. Given forests are dynamic ecosystems, carbon losses from insects and disease, wildfire and harvests are never in exact balance with carbon gains made through new forest growth. Net carbon removals from the atmosphere occur when forest growth exceeds losses from natural and anthropocentric causes. The carbon cycle adds carbon to the atmosphere when forests lose carbon emissions in excess of that being sequestered.

Forest stands that are regrown to pre-harvest carbon stocks before they are harvested again provide few "emissions" when considered across the wood-producing region. This is because the emissions from stand-level plots harvested this year are offset by the uptake occurring in new growth on other plots that will be harvested in the future.ⁱⁱⁱ *Where removals of forest biomass (for products and energy) are less than the forest growth and regeneration (less mortality), the result is stable or increasing levels of carbon in the forest.* As a result, the only way to ensure biomass is being replaced at the rate it is removed (and therefore considered a low (or no) carbon fuel source) is through sustainable forest management. See section III for NASF's recommendations for sustainable forest biomass removals.

National inventories indicate that forest land in the United States is stable or increasing and that forest growth exceeds harvest. This means that forests carbon inventories continue to grow at a faster rate than they are lost and that the biomass carbon cycle in the U.S. is continuing to accomplish net removals of CO₂ from the atmosphere.^{iv} Whether forests continue to sequester carbon depends on whether it is cost effective for landowners to keep their land intact and sustainably managed. Devaluing forest biomass will make other land-uses (e.g., conversion to urban development) with less carbon sequestration potential more attractive to those who own forests. Policies must avoid unintended consequences that limit forests role in mitigating climate change and delaying the nation's shift to clean, renewable energy.

NASF recommends Congress and EPA to rely on an accounting framework for carbon emissions that monitors forest carbon stocks at the regional or national level. The monitoring framework established through the USDA Forest Service—Forest Inventory and Analysis Program is the foundation for annually

reporting on forest carbon stocks under the United States obligation to the United Nations Framework Convention on Climate Change.^{iv} Further investments should be made in the program in order to provide for accurate monitoring of potential impacts on the nation's carbon stocks through the use of forest biomass for energy.

Section II. Forest Biomass Supplies

The U.S. forest products industry contributes 77 percent of the nation's industrial biomass energy—more energy than is produced in the country from solar, wind and geothermal sources combined.^v Forest inventories have increased while meeting existing demands for wood and paper products and renewable energy production. In fact, forest growth nationally has exceeded harvest levels resulting in a standing volume that has increased 50% over the past 50 years.^{vi} As a result, significant potential exists to increase the contribution of woody biomass towards federal renewable electricity and fuels mandates without impairing the productive capacity of the nation's forests or the ecosystem services they provide. There are a number of ways to increase woody biomass supplies including:

- **Planting marginal agricultural land, reclaimed mine land and other bare lands to forests or short rotation wood energy plantations.** The Forest Service Forest Inventory and Analysis (FIA) Program estimates that nearly 40 million acres of marginal land could be converted to forests. While some of these lands need to be retained as grassland or brushland habitats, using short rotation wood energy plantations to help meet demands for renewable energy production can help reduce pressures on the natural environment. Returning sensitive agricultural lands into woody biomass plantations would maintain water quality and improve soil conditions.
- **Increase recovery of biomass from the current forest inventory as part of integrated harvesting.** Given that 90% of the nation's forests are naturally regenerated, woody-biomass production will primarily depend upon increased recovery rates from materials grown and harvested in natural forests.^{vii} Biomass removals included as a component of sustainable forest management strategy that provides an annual sustained yield of timber, fiber, or energy from the forest will generate the largest sustained carbon mitigation benefit.^{viii} NASF recommends that harvesting residuals and trees that are subject to wildfire, insects and disease should be eligible for renewable energy incentives.
- **Extend supplies through use of efficient technologies.** Current energy policy promotes the use of electricity and biofuels from renewable biomass and focuses less attention on thermal energy—a renewable energy source that accounts for roughly one-third of domestic energy use and can reach efficiencies as high as 90%. Combined heat and power (CHP) technologies can be as much as 3-4 times more efficient users of biomass than electricity-only facilities.^{iv} NASF supports the eligibility of thermal energy and energy produced through CHP technologies for renewable energy incentives including renewable electricity credits (RECs) in a federal Renewable Electricity Standard (RES). RECs or other incentives should be awarded for the electrical equivalent amount of thermal energy generated in CHP applications and should be set in a way that maintains a level playing field between existing and new bioenergy facilities. In areas with sustainable supplies of biomass and no realistic CHP opportunities, incentives should recognize and encourage use of biomass for the most efficient use.

- **Provide reliable and sustainable biomass supplies from federal forest lands.** One-hundred ninety million acres of the National Forest System are at risk of uncharacteristic wildfire creating a situation that is economically, socially and ecologically unsustainable. Rough estimates from the Forest Service suggest that wildfires on the National Forest System (NFS) result in roughly 33 million metric tons of emissions annually. Wildfire emissions also increase the rate at which glaciers and polar ice melt by changing albedo and add to global warming. While estimates suggest the NFS is a net carbon sink, wildfire emissions include particulate matter that present public health risks.^{ix} Smoke levels from wildfires are often 10 to 60 times greater than EPA standards.^x

Significant opportunities are available to provide biomass heat for schools and other public buildings and invite new markets for renewable energy and fuels production. Biomass that is harvested during forest health and fuels reduction treatments can be converted to renewable energy using modern institutional biomass systems that leave few (if any) visible emissions or odors and emit far less particulate matter than through open burning. To invite new investment, NASF recommends Congress allow the issuance of Renewable Electricity Credits (RECs) and credits for renewable fuels production (RFS RINs) from biomass sourced from federal lands that are harvested consistent with federal law and each national forest's land and resource management plan. To meet the needs of renewable energy investors, NASF recommends Congress and/or the Administration provide a reliable supply of biomass by addressing contractual barriers (i.e. cancellation ceiling requirements) which limit the use of long-term stewardship contracts on federal lands.

Modern forestry uses timber for producing higher-value products like building materials and furniture. Markets for lower-value materials such as forest logging residues (i.e. slash) and byproducts of forest thinnings and forest health and restoration treatments often do not exist leaving carbon from these materials to be released through decomposition in the forest, insect and disease infestations and catastrophic fire. Other low-value materials such as clean construction debris and urban wood byproducts from land clearing (e.g., for utility right-of-ways, roads) and debris from tree care and landscaping firms are often disposed of in landfills as few, if any, markets exist for these materials. NASF recommends all these materials be counted as eligible feedstocks for which renewable energy credits can be generated under a RES.

Section III. Forest Sustainability and Biomass Harvests

New energy markets have significant potential to improve the health of public and private forests while also helping the nation meet its renewable energy goals. These markets come at a time when the U.S. Forest Products industry has experienced job losses and hundreds of mill closures. In many cases, rural economies are threatened and critical infrastructure required to manage forests is being lost as traditional markets have disappeared. Markets provide the economic ability to sustainably manage forests. In the case of public forests, it drives down the costs to reduce the threat of wildfire and insect and disease outbreaks. On private forests, it can help families and individuals cover their costs to own and manage forests when facing decisions whether to convert to other financially attractive options (e.g., commercial or residential development). New energy market opportunities for renewable forest biomass in each state can be found in the State-wide Forest Resource Assessments and Strategies that were an important outcome of the 2008 Farm Bill.

State Foresters recognize that there are potential environmental impacts associated with all timber harvesting including the removal of forest biomass for energy production. At the same time, a strong framework of federal and state laws, regulations and Best Management Practices exists alongside a

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number of voluntary programs to mitigate impacts to soil productivity, wildlife habitat, water quality, threatened and endangered species, and biodiversity. For instance, Best Management Practices (BMPs) and forest management guidelines (FMGs) have been developed and published in 49 states.^{xi} Most of these are focused on water quality protection, but often include guidelines for timber harvesting (including in and around wetlands), site preparation, reforestation, stream crossings, road construction and maintenance, prescribed burning and pesticide and fertilizer use.^{xii}

NASF encourages Congress to structure renewable energy legislation to allow biomass from private forests that are managed consistent with a Forest Stewardship Plan (developed under the Forest Stewardship Program) or equivalent approved by the State Forester to be eligible for RECs. The Forest Stewardship Program provides families and individuals with the technical information necessary to encourage long-term stewardship and sustainability of their forests. Planning assistance is delivered through state forestry agencies primarily through the development of Forest Stewardship Plans. The Forest Service has issued plan criteria and resource elements to be considered in Forest Stewardship Plans including soil, water, aesthetics, threatened and endangered species, fish and wildlife, wetlands, carbon cycle and others. State guidelines must consider the NASF *Principles and Guides for a Well-Managed Forests*.^{xiii}

Management guidance equivalent to that found through a Forest Stewardship Plan should be determined by the State Forester in each state. Biomass removed consistent with each state's determination should be considered an eligible feedstock for renewable energy incentives and RECs. Under the Biomass Crop Assistance Program, State Foresters provided landowners a number of options to demonstrate sustainability to the public by considering equivalent management guidance to include biomass from any of the following sources (among others):

- **Biomass Harvesting Guidelines.** A number of states have chosen to augment their BMPs and FMGs to address biomass harvesting based on local forest ecosystems, harvesting pressures, ownership patterns, and management objectives. These states have chosen to develop biomass harvesting guidelines to fill gaps where existing BMPs and forest practices regulations may not be sufficient to guide biomass removals.^{xii}
- **Natural Resource Conservation Service Forest Management Plans.** These plans, often referred to as "Section 106" plans, are prepared by professional foresters and comply with state standards. These plans are required to address soil conditions, fish and wildlife habitat, water quality and other important criteria that align with the national standards for Forest Stewardship Plan developed under the Forest Stewardship Program.
- **Third-party Forest Certification.** Forest certification systems such as the Forest Stewardship Council, Sustainable Forestry Initiative and the American Tree Farm System require forests to be managed to high standards for wildlife habitat, soils, water quality, and biodiversity. While these systems do not currently address forest biomass removals, they do set standards and expectations for post-harvest forest conditions and are not related to the type of harvest.
- **Other Sustainability Measures Approved by the State Forester.** The social, economic, ecological and legal context for which forests are managed vary from state to state. Renewable energy legislation should allow flexibility for states to identify appropriate measures to address sustainability concerns associated with forest biomass removals.

The USDA Forest Service and State Foresters have the technical expertise necessary to help develop reliable estimates of sustainable biomass supplies needed by renewable energy investors. The primary tool in providing estimates of sustainable biomass supplies is the FIA Program which is administered by

the Forest Service in partnership with State Foresters. The FIA program provides the baseline data needed to make informed decisions about sizing renewable energy facilities that match the ability of local forests to sustainably supply biomass now and into the future. If maintained and enhanced, the FIA program will continue to serve a valuable role in monitoring the carbon balance associated with using forest biomass as a renewable energy source.

State Foresters are well-positioned to interpret FIA data and generate estimates of biomass availability given regional and local variations in forest types. In some cases, states have augmented the FIA data by collecting additional on-the-ground information to make more accurate inventory estimates. State Foresters welcome a consultative role in working with new and existing bioenergy facilities to generate estimates of biomass availability given potential landownership, accessibility, and geographical limitations as well as to scale the facilities to the local resource. Bioenergy facilities, like forest products manufacturers, should be responsible for working with biomass suppliers, harvesters and state foresters to ensure biomass utilization is done in a sustainable manner. The responsibility for assuring that procurement practices are consistent with the legal and regulatory framework of the applicable state should reside with bioenergy facilities (and not individual landowners and other suppliers of biomass).

Summary of NASF Recommendations for Renewable Energy-Related Legislation and Regulations

Significant potential exists for the expansion of renewable energy from the combustion of forest biomass. This expansion will only occur if federal renewable energy policies are structured in a way to encourage the sustainable use of forest biomass now and into the future. To that end, NASF offers the following recommendations as Congress and the Administration consider legislation and regulations addressing the role of forest biomass in meeting renewable energy mandates:

Greenhouse Gases and Wood-based Bioenergy Development

- Congress and EPA should rely on an accounting framework for carbon emissions that monitors forest carbon stocks at the regional or national level. This is consistent with current reporting obligations of the U.S. under the United Nations Framework Convention on Climate Change.
- Further investments should be made in the USDA Forest Service—Forest Inventory and Analysis program in order to provide accurate monitoring of potential impacts on the nation's carbon stocks through the use of forest biomass for energy.

Forest Biomass Supplies

- Woody biomass including (but not limited to) logging residues, residues from forest or manufacturing operations, byproducts of fuels reduction and forest health and restoration treatments, clean construction debris, urban wood waste, byproducts of land clearing (e.g., for utility right-of-ways, roads) and debris from landscaping firms should all be considered as eligible materials for renewable energy incentives and renewable electricity credits (RECs) under a federal RES.
- Thermal energy and energy produced through CHP technologies should be eligible for renewable energy incentives and RECs in a federal renewable electricity standard.
- RECs or other incentives should be awarded for the electrical equivalent amount of thermal energy generated in CHP applications and should be set in a way that maintains a level playing field between existing and new bioenergy facilities.
- In areas with sustainable supplies of biomass and no realistic CHP opportunities, incentives should recognize and encourage use of biomass for the most efficient use.
- The existing forest products industry should receive equal treatment for utilizing biomass to produce renewable energy. RECs and other incentives should be available to all qualifying facilities regardless of products produced.

- Congress should allow the issuance of renewable electricity credits (RECs) and credits for renewable fuels production (RFS RINs) from biomass sourced from federal lands that are harvested consistent with federal law and each national forest's land and resource management plan.
- Congress and/or the Administration should provide a reliable supply of biomass by addressing contractual barriers (i.e. cancellation ceiling requirements) which limit the use of long-term stewardship contracts on federal lands.

Forest Sustainability and Biomass Harvests

- Renewable energy legislation should allow biomass from private forests that are managed consistent with a Forest Stewardship Plan or equivalent approved by the State Forester to be considered an eligible feedstock for renewable energy incentives and RECs.
- The responsibility for assuring that procurement practices are consistent with the legal and regulatory framework of the applicable state should reside with bioenergy facilities (and not individual landowners and other suppliers of biomass).
- Federal policy should affirm the leadership role of State Foresters in protecting and managing nonfederal forests and commit federal funding to support new responsibilities assumed by state forestry agencies that involve ensuring the sustainability of biomass harvests.

Meeting the nation's renewable energy goals will require significant contributions from all renewable energy sources including wind, solar, biomass and other renewables from all regions of the country. Burning wood, plants and other organic material already constitutes 50% of all renewable energy produced in the United States, yet biomass—particularly from the nation's forests—can contribute significantly more. It is essential for Congress and the Administration to demonstrate their commitment to domestic energy production, green job creation, and national security by sending clear signals regarding the significant role forest biomass can play in meeting the nation's renewable energy goals.

Endnotes

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- ^{xiii} National Association of State Foresters. 2003. Principles and Guides for a Well Managed Forest. Last accessed on-line on August 17, 2010 at: <http://www.stateforesters.org/files/2003Principlesand%20Guides.pdf>