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SUBCOMMITTEE ON UNDERSERVED, AGRICULTURAL, AND RURAL BUSINESS DEVELOPMENT
HOUSE COMMITTEE ON SMALL BUSINESS

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"Sustainable Forestry's Role in Climate Solutions"

Good morning Chairman Jared Golden, Ranking Member Jim Hagedorn and members of the Subcommittee.

Thank you for the opportunity to appear before you to discuss sustainable forestry's role as a climate solution. I will speak specifically to wood energy as a climate solution.

I am Mark Thibodeau. I am a lifelong Mainer and I am a graduate of Maine Maritime Academy with a degree in Marine Systems Engineering. I live in Maine's 2nd Congressional district and I serve as regional manager for ReEnergy Biomass Operations in Maine. I have managed five biomass power generation plants in the state of Maine in the course of my career, as well as five in California. Before joining ReEnergy in 2012, I served as Director of Biomass Operations for Covanta Energy. Prior to that, I was a Field Engineer in General Electric's Energy Services Division, performing major overhauls on steam turbine generators. I hold a 1st Class Stationary Engineers license in Maine.

About ReEnergy

ReEnergy Biomass Operations operates two biomass power facilities in Maine, both in the 2nd Congressional district, that generate baseload renewable electricity. At these facilities in Livermore Falls (39 MW) and Stratton (48 MW), we use sustainably harvested forest and mill residue as fuel to generate homegrown, renewable electricity. These facilities directly employ about 50 people and support hundreds more jobs in the logging and trucking industries while providing the forestry industry an important revenue stream for their wood residues. The facilities generate approximately 640,000 megawatt-hours of baseload renewable electricity each year, which is enough to supply power to 83,000 homes. Baseload power is electricity that is generated 24/7, and is an important complement to intermittent sources of power like wind and solar. The Stratton facility also provides electricity directly to an adjacent lumber mill. Our wood ash from Stratton, also known as "fly ash," is used by more than 100 Maine farms as a soil amendment for balancing soil pH and enhancing nutrient levels.

ReEnergy also operates a 60-MW biomass power facility in New York State, ReEnergy Black River, which is located inside the fence at the U.S. Army installation Fort Drum. That plant provides all of the post's electricity from behind-the-meter, creating energy security and resiliency. Lastly, we operate the 50-MW Albany Green Energy, a 50-MW biomass heat-and-power facility located in Albany, Georgia, which supplies electricity to Georgia Power and steam to Procter & Gamble and a nearby Marine Corps Logistics Base.

How Biomass Energy Supports Sustainable Forestry

Sustainable forestry is an important contributor to mitigating climate change and reducing the risk of wildfire. When forested lands are maintained and harvested in a sustainable way, the forest continues to grow and consume atmospheric carbon. Wood markets and wood utilization are essential to forest maintenance; without an outlet for owners to sell their harvested wood, the owners are more likely to sell the land for other uses. Biomass power is an important component of the larger wood market. After the higher-value fibers are sold to make lumber, furniture or paper, the landowner is left with lower value fibers like tops, limbs and thinnings that cannot easily be made into other wood products. When these "leftovers" or residues are sold to a biomass power facility, the landowner is able to further capitalize on their harvest and the unusable fibers go toward generating baseloaded renewable energy.

U.S. biomass power facilities are located primarily in rural areas with active forest and/or agricultural economies. We use fuels that are residuals and byproducts of forest products and agricultural businesses, adding an additional and often much-needed revenue stream to these sectors and utilizing materials that often have very few other uses. In some areas, biomass power facilities are actively involved in the reduction of catastrophic wildfires by repurposing forest debris that is very hazardous during wildfire season.

Our fuel suppliers follow best management practices that ensure sustainable forest management. We expect our suppliers to follow these best management practices with respect to water quality, protection of endangered and threatened species, logger training and reforestation. In all of our communities, forest growth greatly exceeds removals.

Carbon Benefits of Biomass

Energy generated from biomass is recognized as having carbon benefits by most scientists, as well as many environmental organizations and regulators in the U.S. and many other countries. This is because the carbon released by biomass power generation is already a part of the carbon circulating between the atmosphere and the biosphere (e.g., trees and plants). Thus, like other types of renewable energy including wind, solar, geothermal and hydro, biomass energy production displaces GHG emissions that would have been produced had that energy been generated from fossil fuels.

Even though biogenic emissions generate CO_2 on a gross basis, when the lifecycle benefits of biomass are calculated, the net emissions from biomass are considered negligible, “neutral” or even “negative,” depending upon the type of biomass.

Additionally and uniquely among renewable energy technologies, biomass energy also reduces net GHG emissions in a second way. The use of biomass for energy generation avoids the higher GHG emissions associated with alternative means of biomass disposal. If not used as fuel, biomass could have several different fates – decaying in the forest, open burning, landfilling, composting or other means of disposal. Each of these alternatives has a greater greenhouse effect than does biomass power generation because they produce and release significant quantities of methane, which is 25 times more potent as a GHG than carbon dioxide. The controlled combustion of biomass for electrical power generation converts essentially all of the carbon into less potent carbon dioxide.

In 2007, the Intergovernmental Panel on Climate Change (IPCC) synthesized decades of research on the use of forests and forest products to mitigate greenhouse gases (GHG), and concluded, "In the long-term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fiber or *energy* from the forest, will generate the *largest sustained mitigation benefit*" (emphasis added). [1] The IPCC's conclusion was based on the idea that energy, including electricity, produced from forest biomass returns carbon to the atmosphere that plants recently absorbed. It results in an extremely low net release of carbon as long as forest inventories are stable or increasing – as is the case in Maine and the United States as a whole.

Conversely, energy from burning fossil fuels releases carbon that has resided under the Earth's surface for millions of years, effectively creating a one-way flow to the atmosphere. Importantly, whether emissions from fossil fuel combustion are ultimately absorbed by land, ocean or forests, they are not returned to fossil fuel reserves on anything less than a geologic time scale. In fact, this is the root cause of climate change: humans have been emitting carbon into the atmosphere that has been locked in the Earth for hundreds of millions of years at a rate which the atmosphere cannot assimilate. As the IPCC notes, nearly 90% of these emissions are from burning fossil fuels and cement production. Using wood to produce electricity avoids the flow of geologic carbon to the atmosphere, thereby providing a real and permanent climate change benefit, provided that energy offsets the use of fossil fuels.

The peer-reviewed literature is absolutely clear: although "the timing of benefits from substituting sustainably produced forest based fuels and products for more GHG intensive alternatives is sometimes debated, the fact that these ultimate benefits exist is not. …. [Agreement] on this issue is based on an extensive body of research, dating at least to the mid-1990s …, and reinforced by [nearly 25] … recent studies and reviews focusing on forest-based energy as a substitute for fossil fuels." A review of this literature caused researchers to conclude, "As long as land remains in forest, long term carbon mitigation benefits are derived from sustainably managed working forests that provide an ongoing output of wood … to produce long-lived products and bioenergy, displacing GHG-intensive alternatives."[2]

The impacts of forest harvesting on carbon emissions are important, yet counterintuitive. The demand for wood (1) keeps land in forests, (2) provides incentives for expanding forests and improving forest productivity, and (3) supports investments in sustainable forest management that can help offset the forest carbon impacts of increased demand. The history of U.S. forests shows that increased demand can be met without reducing forested area or forest carbon stocks. [3]

Research demonstrates that demand for wood in the United States results in investments in forestry that help to prevent loss of forest, which is caused primarily by urbanization and development, and incentivize afforestation (i.e., the planting of forests). In the face of pressures to convert land to other

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[1] Nabuurs, G.J., O. Masera, K. Andrasko, P. Benitez-Ponce, R. Boer, M. Dutschke, E. Elsiddig, et al. 2007. Forestry. Chapter 9 in Climate change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Metz, B., O.R. Davidson, P.R. Bosch, R. Dave, and L.A. Meyer (eds.). Cambridge University Press, Cambridge, UK. p. 543

[2] Miner, R.A., R.C. Abt, J.L. Bowyer, M.A. Buford, R.W. Malmsheimer, J. O'Laughlin, E.E. Oneil, R.A. Sedjo, and K.E. Skog. 2014. Forest Carbon Accounting Considerations in U.S. Bioenergy Policy. Journal of Forestry 112(6):590-605, p.593

[3] Miner, R.A., R.C. Abt, J.L. Bowyer, M.A. Buford, R.W. Malmsheimer, J. O'Laughlin, E.E. Oneil, R.A. Sedjo, and K.E. Skog. 2014. Forest Carbon Accounting Considerations in U.S. Bioenergy Policy. Journal of Forestry 112(6):590-605, p.594

uses, increased wood demand in the United States can slow the loss of forested area in the face of pressures to convert land to other uses. For example, a study published in Environmental Science and Technology projected that, as a result of increased wood demand for energy, U.S. forest area could expand by 4 to 8.6 million acres by 2015 and 11.9 to 26.9 million acres by 2030. [4] "Other studies have found that where the investment response to increased demand is strong, it can increase both forest area and forest carbon stocks, especially where investments are made in anticipation of increased demand." [5]

The Biden Administration's Environmental Protection Agency (EPA) Deputy Administrator, Janet McCabe, recognized the benefits of using biomass from wastes and residuals when she served as Acting Assistant Administrator of the Office of Air and Radiation at EPA in the Obama Administration. In a November 2014 memorandum about the role of biomass in the Clean Power Plan, she wrote: "Information considered in preparing the second draft of the Framework, including the SAB [Scientific Advisory Board] peer review and stakeholder input, supports the finding that use of waste-derived feedstocks and certain forest-derived industrial byproducts are likely to have minimal or no net atmospheric contributions of biogenic $C0_2$ emissions, or even reduce such impacts, when compared with an alternate fate of disposal."[6]

Federal Policy Issues

With respect to federal policy issues, we are active members of the Biomass Power Association, which represents domestic biomass power producers who source fuels from their local communities.

It often seems to us that domestic biomass power is the least understood renewable energy resource. We have been working for years to urge the Environmental Protection Agency to implement the electricity portion of the Renewable Fuel Standard, and activate its biomass pathways, for example, and to address definitional interpretations of the term "biomass" in the Renewable Fuel Standard.

Without equitable policy support, it can become difficult for biomass to serve as a robust part of the country's renewable energy portfolio. We have been trying to address tax inequities that prioritize the growth of other renewable technologies at the expense of biomass and other baseloads. We have serious concerns about the Clean Electricity Performance Program, which has been endorsed by the House Committee on Energy and Commerce but does not specify that biomass power emissions would be measured on a net basis using a life-cycle analysis.

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[4] Daigneault, A., B. Sohngen, AND R. Sedjo. 2012. Economic approach to assess the forest carbon implications of biomass energy. Environmental Science and Technology 46:5664 –5671.

[5] Miner, R.A., R.C. Abt, J.L. Bowyer, M.A. Buford, R.W. Malmsheimer, J. O'Laughlin, E.E. Oneil, R.A. Sedjo, and K.E. Skog. 2014. Forest Carbon Accounting Considerations in U.S. Bioenergy Policy. Journal of Forestry 112(6):590-605, p.596

[6] EPA's Addressing Biogenic Carbon Dioxide Emissions from Stationary Sources, Janet McCabe, Nov. 14, 2014, found at https://archive.epa.gov/epa/sites/production/files/2016-08/documents/biogenic-co2-emissions-memo-111914.pdf

The Role of Underserved Communities

In closing, it is important to note, given one of the primary focuses of this committee, that there are many underserved communities across the country that rely on forestry for income, with biomass being part of their revenue stream. For example:

- Native Americans are among the largest owners of commercial forestry resources in the United States, controlling 16 million acres of forestland. Some of our fuel at our facilities here in Maine come from tribal land managed by the Penobscot Nation.
- The Indian Land Tenure Foundation in Minnesota provides grants and services to Indian nations and individual Indian people focused on recovering land within reservation boundaries and off-reservation sacred sites to Indian ownership and management.
- The White Mountain Apache Tribe in Whiteriver, Arizona manages a 1.6-million-acre reservation, much of it forested. The Apache land is at high risk of forest fire, and the Tribe works its forests to reduce the risk of catastrophic fire. Novo Power, a biomass power plant located in Snowflake, AZ, purchases more than 1,000 tons of fuel annually from the Tribe.
- The Center for Heirs' Property in South Carolina assists people in preserving their land as working forests.
- North Carolina State University's College of Natural Resources works to recruiting minorities to the forestry industry.

I appreciate the opportunity to provide testimony to the Committee and I thank you for your public service. Please feel free to contact me at any time with questions or concerns.