Testimony to the US House of Representatives Committee on Agriculture,
Subcommittee on Conservation, Credit, Energy and Research
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Thank you for giving me the opportunity to speak to you today about the potential use of wood biomass for energy. While much of what I will discuss applies at a national level, my expertise primarily relates to the northeastern US, specifically Pennsylvania, so my testimony will be informed by this regional perspective.

Forests are the dominant land use in the northeastern US. Roughly two thirds of the region is forested. Furthermore, more than 85% of this forestland is privately owned, with about 85% of this private forestland owned by families and individuals not associated with the forest products industry. The vast majority of this forestland (with the exception of Maine) is naturally-regenerated second- or third-growth oak-hickory and northern hardwood forests. The northern US has an abundant supply of wood. Between 1953 and 2007 the estimated net volume of growing stock on forestland in the northern US more than doubled, from 103.7 billion cu ft to 248.0 billion cu ft. USDA Forest Service Forest Inventory and Analysis (FIA) data indicates that Pennsylvania's forests alone contain 1,146 million green tons of biomass. (A green ton is equivalent to about half a ton of dry biomass.) More than half of the wood in the state has been classified as so-called "low use" wood. Due to a relatively small pulp and paper industry in the region, markets for this low use wood are limited.

Most forest landowners and proponents of sustainable forest management believe that improved markets for low use wood – such as would exist with a growing biomass energy industry – would provide opportunities to better manage the region's forests. Such markets would provide additional income for landowners to help offset management costs; it would make additional management practices, such as improvement thinnings, commercially feasible; and it would reduce incentives to high-grade forests (a practice where only the best trees are harvested, degrading the species composition and genetic quality of the forest over time). Low use wood is abundant wherever there are forests and limited demand for pulpwood. For example, in much of the western US, material from thinnings done to reduce fuels, and hence the susceptibility of forests to devastating wildfires, is currently being collected in huge piles where it is typically left to rot for lack of a viable market. It is my understanding that much of this low use wood – from both the natural, private forests in the East and from western federal lands – cannot currently be counted toward the Renewable Fuels Standard (RFS) targets. Frankly, the rationale for this is difficult for me to understand.

A crucial advantage of biomass-based energy is that it currently is the most economical alternative to fossil fuels for producing liquid fuels. In spite of the attention given to corn ethanol in recent biomass energy discussions, wood is still the most important feedstock for biomass energy in the US. This is largely because the wood products industry has long been very efficient in its use of residues produced in sawing lumber and making pulp. Wood biomass can be burned directly in heating systems, for both individual homes and for institutions such as schools, hospitals and commercial buildings. Wood can also be burned to directly generate electricity or in combined heat

and power facilities. And wood can be co-fired with coal to produce electricity. Wood pellets produced from sawdust are now a very cost-competitive fuel for residential heating. When the promise of cellulosic biofuels is realized, Pennsylvania could potentially replace up to one third of the gasoline used in the state with wood-based ethanol and other advanced biofuels.

There are, of course, many uncertainties about how all this will play out over the coming years. It is uncertain what the true life-cycle greenhouse gas savings are in these processes relative to fossil fuels. Another key question is how much low use wood is really available at what cost. There is some uncertainty as to how much of this low use wood there actually is, and few attempts to quantify this resource have even tried to accurately assess how the available amount would vary with different prices. Key factors affecting the quantity that would be available at a given cost include harvesting and transportation costs. However, an important related question that is even more difficult to answer is the extent to which private landowners would be willing to allow harvesting on their properties. Many surveys of forest landowners have shown that earning income from harvesting wood is a low priority for many of them. Also important is the question of how growing markets for biofuels will change forest management practices. Again, in many cases having these markets will improve forest management by providing additional income and paying for practices that are currently not commercially viable. However, increasing use of wood for biofuels could lead to shorter rotations and shifts from natural forests to plantations. To what extent will it be cheaper to simply grow wood in short-rotation biomass plantations (either switchgrass, or tree species such as hybrid poplar and willow)? What will be the environmental impacts of removing more biomass during harvests? Removing more biomass means removing more of the nutrients from the site and reduction of woody debris which provides important habitat. Also, more intensive harvesting practices could lead to soil compaction and more roads, further fragmenting already fragmented forests.

The research we currently are doing at Penn State attempts to answer only a few of these questions. In particular, we are trying to do a better job of quantifying biomass and other product yields and harvesting, collection, and transport costs based on actual operations in the field. We are also planning to assess soil nutrient impacts and compaction. We are looking to expand this research to look at a larger set of the questions discussed above.

I hope my comments have helped give you a broader perspective on the potential of wood as a biofuel feedstock. Wood has obvious advantages for such uses. First, the US has an abundant supply of wood biomass that is currently not being used. Use of this resource could be complementary to existing wood products industries and promote improved forest management. And, unlike corn ethanol, using wood does not generally compete with food production. It is important to significantly broaden the definition of cellulosic ethanol within the Renewable Fuels Standard (RFS) to include wood biomass from all sources. Thank you again for giving me this opportunity to speak to the subcommittee. I look forward to answering your questions.