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Comments on: Economic Analysis of the Northeast/Mid-Atlantic Low Carbon Fuel Standard: Draft Data and Assumptions, Part I, NESCAUM

May 7, 2010

Dear Mr. Dick,

These comments are offered in response to an invitation to stakeholders to review the draft data and assumptions for the economic analysis of a regional Low Carbon Fuel Standard for Northeast and Mid- Atlantic states. The Wilderness Society is interested in the development of biomass as a fuel source and advocates for energy policies that protect important forest resources while encouraging expanded renewable energy supply. We encourage the New England States for Coordinated Air Use Management and New England States for a Clean Air Future to consider a more nuanced analysis of woody biomass energy feedstocks that reflects cumulative impacts of wood demand across multiple energy sectors and differentiates the impacts of distinct sources of wood materials. We applaud the inclusion of scenarios with low discount rates to reflect the lack of consensus on appropriate values.

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Cumulative Demand

Economic analyses for renewable energy expansion using wood as a feedstock often estimate the wood supply available for a single use, without projecting increased demand from other segments of the energy industry. Electricity, heating fuel, and transportation fuel sectors are all interested in wood as a potential feedstock for new energy development. The LCFS reference case assumes that states in the region will comply with

Renewable Portfolio Standard targets and that the nation as a whole will comply with the national Renewable Fuels Standard. Presumably, these assumptions imply expanded use of wood from this region to supply Northeast electricity demand (including conversion of coal plants to wood) and increasing use of biofuels here and nationally. However, these assumptions will not account for expanded demand from states without an RPS, possible expansion of uses above the minimum required by RPS, production of off-the-grid process electricity, regional heating fuels demand (including both wood pellets and firewood) or wood fuels exports.

Expanded demand for wood from other sectors may introduce constraints on wood supply that are not fully reflected in assumptions outlined in Introducing a Low Carbon Fuel Standard in the Northeast - Technical and Policy Considerations, July, 2009, Northeast States Center for a Clean Air Future. At a minimum, expanded demand for wood is likely to affect the assumed price per ton of wood purchased by biofuels plants as sources shift from low-cost waste materials to virgin wood harvested to meet biomass energy demands. Since different types of wood feedstocks have very different carbon intensities (see below), such a shift also means that a larger proportion of the supply will come from sources with greater carbon impacts.

In order to assess cumulative impacts across the entire energy sector, we recommend that the reference case, or at a minimum a sensitivity test, should incorporate projected demand for wood from new, converted, or expanded electricity facilities and wood pellet facilities located within the LCFS region or drawing wood from this region. This projection should also include expected exports of wood chips or pellets in response to expanding demand from outside the region, particularly from Europe.[1] The recently-released NYSERDA renewable fuels roadmap contains some basic assessments of future wood demand in that state,[2] though overseas exports are included only to the extent that proposed wood pellet facilities may export their products.

The low end of the range of estimated wood supply from the July, 2009 report, at 15% of technically available tons, may sufficiently reflect supply limitations due to both landowners' reluctance to harvest and expanding demand from other wood users. Some quantitative estimation of these factors, as well as explicit mention in report text, would help users of the study recognize that actual supply might be closer to the low-range estimate than the high-range.

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[1] European pellet imports jumped 62% from the first quarter of 2008 to the same quarter in 2009 (Russell Gold. July 7, 2009. Wood Pellets Catch Fire as Renewable Energy Source. Wall Street Journal). Recent projections show European demand reaching over 56 million green tons/year (William Perritt, February, 2010. Wood Biomass Market Report. RISI).

[2] See New York State Energy Research and Development Authority. April, 2010. Renewable Fuels Roadmap and Sustainable Biomass Feedstock Supply for New York. Appendix O – Biofuels Markets in New York State and Integration in the Northeast Region and Appendix P – Competition for Biomass Resources.

Carbon Intensities

The Carbon Intensities listed for cellulosic ethanol produced from residual and virgin materials on slide 58 of Economic Analysis of the Northeast/Mid-Atlantic Low Carbon Fuel Standard: Draft Data and Assumptions, Part I, April 2010, NESCAUM are both negative numbers. Presumably this is because feedstocks are assumed to be energy crops (specifically switchgrass feedstocks) established on land with lower average carbon stocks under the previous land us, such as land used for row crops. These negative CIs are unlikely to apply to wood feedstocks in the LCFS region, and wood from different sources is likely to have very different CI values.

Net sequestration (negative emissions) might apply to woody biomass plantations on agricultural lands due to higher average carbon levels above-ground over time and greater below-ground carbon stocks as dead roots are incorporated into long-lived soil organic matter. Due to high real estate values in the Northeast and Mid-Atlantic, however, conversion of cropland or pasture to woody plantations would be limited, and it does not appear that woody biomass plantations were considered in the supply estimates.

Some forms of wood feedstocks that are projected to be available in our region may have low, but positive, CI values. True waste materials (un-utilized mill and urban waste, for instance) would likely decompose quickly and release carbon dioxide and perhaps methane if not used for energy. GHG emissions associated with these fuels are mainly due to processing and transport of materials. The July, 2009 supply estimates assume that only 43% of woody biomass available for manufacture of transport fuels will come from these relatively low-emission waste sources.

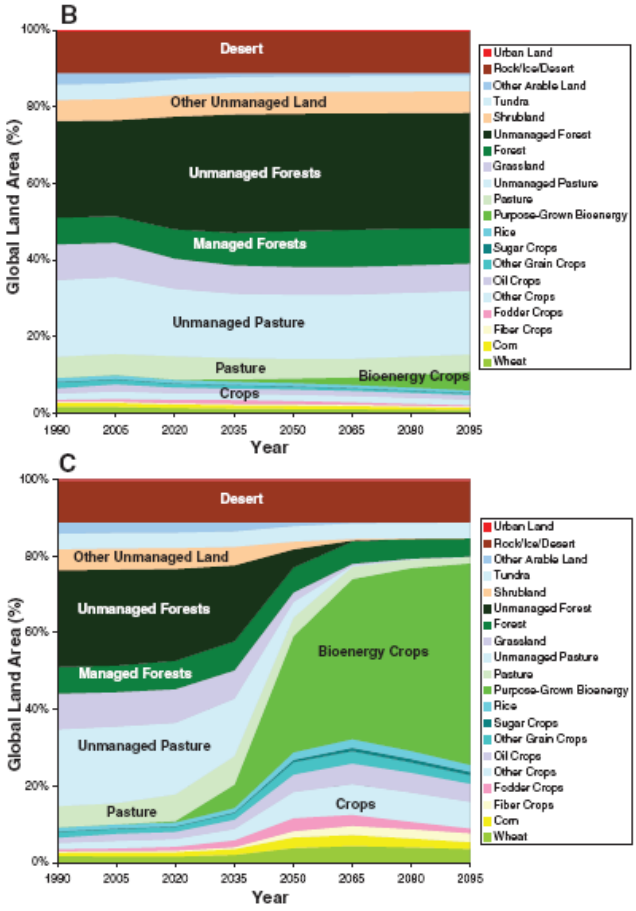
The remainder of woody biomass materials are removed from forest environments and will have differing carbon intensities depending on their impacts on the source forest.

- 27% of estimated woody biomass supplies are un-utilized logging residues from current harvests. Logging residues may be considered a low-carbon source, but only if their use does not trigger additional harvest activity, harvest standards require retention of sufficient downed wood to protect long-term forest productivity, and transport distances are limited.
- 30% of estimated available wood supply depends upon expanded harvest, and this source will nearly always decrease forest carbon stocks compared to a baseline without increased utilization. Some forest carbon studies[3] indicate that thinning of suppressed and declining trees may accelerate carbon uptake by releasing more vigorous trees from competition, but only following a temporary decline in carbon stocks while remaining vegetation gradually refills the available space with new photosynthetic capacity. Silvicultural thinnings are generally designed to

[3] See, for example, Coeli Hoover and Susan Stout. 2007. *The carbon consequences of thinning techniques: stand structure makes a difference*. Journal of Forestry 105(5):266-270.

concentrate growth on commercially valuable stems, at the expense of reducing total volume and hence carbon stocks. Even if expanded harvests to supply biomass markets are carefully regulated, increased removals for biofuel use would likely reduce average forest carbon stocks across forests in the source region, compared to a scenario with no or less-intensive harvest.

The importance of correct accounting for biological carbon stocks was highlighted by Wise et al. (2009)[4]. Modeling showed that if emissions from land use changes are neglected in climate and energy policy, and bioenergy feedstocks are considered carbon neutral by definition, there would be strong incentives to convert managed and unmanaged forests to cropland to produce energy crops. Reduced carbon stocks on land that remains forested are less severe than the impacts caused by land use changes, but they are nonetheless direct land-based effects of expanded wood energy use, and should be incorporated in carbon intensity calculations.



GHG impacts of expanded wood use depend upon the assumed baseline in the absence of incremental demand due to LCFS. If forest carbon is expected to accumulate over time in the absence of a program, then even stable regional carbon stocks are not sufficient to claim "carbon-neutrality" for wood as a feedstock. It should be possible to model the extent to which increased removals will affect average carbon stocks over time, compared to expected forest growth in the absence of those removals.[5]

The range of CI values for woody biomass of different types should be reflected in the GHG assessments for both biofuels that use the wood directly and as a fuel source for

[4] Wise, Marshall et al. 2009. *Implications of Limiting CO2 Concentrations for Land Use and Energy.* Science 324: 1183

[5] See, for example, Jared S. Nunery and William S. Keeton. 2010. *Forest carbon storage in the northeastern United States: Net effects of harvesting frequency, post-harvest retention, and wood products.* Forest Ecology and Management 259: 1363–1375.

expanded electricity supply sufficient to power electric vehicles that meet LCFS goals. One way to reflect differences in carbon intensity for distinct wood sources would be to conduct sensitivity analyses that use the full range of possible carbon intensities for the wood portion of LCFS fuel feedstocks. An alternative would be to conduct a single sensitivity test that eliminates wood sources from expanded harvest as an accepted low-carbon source, and assumes wood availability only from mill waste, logging residues and urban waste wood – all sources with lower carbon intensities.

Discount Rates

Finally, we applaud the inclusion of a sensitivity test with a 0% discount rate to illuminate the importance of discounting to the final result. We believe that very low social discount rates are appropriate when analyzing climate impacts. Discounting of future impacts is one of the obstacles to current action to forestall a future crisis, and the usual economic assumptions that future individuals will be better off economically may no longer hold for this case.

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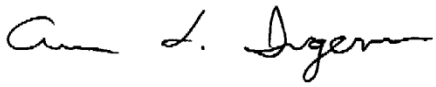
We look forward to continued discussion of the LCFS. Please continue to keep us informed of opportunities to review and comment. Thank you for your time and consideration.

Sincerely,



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