4 June 2019

Mr. John Wassam
Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

Dear Mr. Wassam:

As the lead author for the carbon accounting chapter of the Manomet study, I am writing to provide comments on the DOER's proposed changes to the forest biomass requirements included in 225 CMR 14—Renewable Energy Portfolio Standard – Class I (RPS Class I). My comments address three elements of the regulations.

- Forest Derived Thinnings
- Forest Salvage
- Single versus Multi-Year GHG Approach

The comments generally relate to the timing of biomass benefits with respect to climate change. In 2010, the Manomet report noted that the structure of biomass policies would likely be shaped by policy-makers' views about the urgency of the need for controlling greenhouse gas (GHG) emissions in the nearer versus the longer term. In the nearer term, biomass burning of many forest-based feedstocks would increase GHG emissions, but over longer time frames absorption of carbon in re-growing, sustainably managed forests could provide climate benefits. Over the past decade, Massachusetts has opted for policies that reflect a greater sense of urgency about climate change and a focus on ambitious short-term emissions reduction goals. In light of these policy decisions by the legislative and executive branches, some of the approaches deeply embedded in DOER's approach to biomass regulation now appear to be at odds with the State's broader GHG regulatory policies. Moreover, some of the new proposals would appear to worsen these inconsistencies. The modeling and analysis underlying these policy implications is complex and not easily understandable by the broader public. It is my hope in these comments to add some context and clarity about the GHG policy implications of the existing regulatory approach and the proposed changes affecting forest biomass.

1. Forest Derived Thinnings

Although DOER has allowed facilities to include forest derived thinnings as a feedstock since promulgation of the original RPS I regulations, this no longer appears appropriate given the State's increased emphasis on near term GHG reductions. Examination of the carbon debt recovery curve for thinnings included in the Carbon Deficit Analyses tab of the proposed RPS Efficiency and GHG Analysis model—which is based on data from the Manomet study--indicates that for a single year of emissions, only about 20 percent of the carbon from thinnings has been recovered at the revised year 30 reference date proposed for evaluation of compliance with the regulation. The only way generating units can meet the 50 percent regulatory reduction requirement is by blending thinnings with more climate friendly forest derived residues. Effectively what is happening is that the regulation is providing a subsidy for the disposal of low-quality forest materials (thinnings) that generate no near-term climate benefits. If

forest derived thinnings were the only available feedstock, a generator facility would never qualify for inclusion in the RPS under the standard. Only by allowing thinnings to be blended with residues does the rule give them the appearance of providing near-term climate benefits.

Essentially, this is a case of the State, through its biomass regulatory program, creating a subsidy for forest landowners that allows them to dispose of a low value product under the guise of generating near term climate benefits where no such benefits exist. When thinnings are blended with more climate friendly residues, the net near term climate benefits of providing RPS credits for biomass are reduced because, for every ton of emissions from thinnings burned for bioenergy, GHG's in the atmosphere are higher after 30 years than they would be had only forest derived residues been burned.

Moreover, from the perspective of the state's electricity rate payers, granting RPS feedstock status to thinnings represents an inappropriate economic subsidy. There is a strong likelihood that most of the value of RPS credits will end up going to out-of-state forest landowners. Historically, it has been biomass plants in Maine and New Hampshire that accounted for much of the generation that was sold into Massachusetts under the RPS program. A policy to subsidize forest landowners who supply thinnings from lands in these states would make sense if there were an actual greenhouse gas benefit from the policy. But absent such a benefit, it makes no sense that Massachusetts citizens should be charged higher electric rates through the RPS to increase the incomes of forest landowners in other New England states. This seems particularly misguided if the subsidy is working against the short-term goals of DOER's own greenhouse gas reduction programs in the state (i.e., increasing GHGs in the short-run when other DOER programs are trying to lower them).

If the public wants to subsidize forestry in Massachusetts, it would be preferable to design programs that actually work in tandem with, rather than in opposition to, the State's other greenhouse gas reduction goals. Such programs could target subsidies to benefit the forest landowners of this state rather than sending the dollars of Massachusetts' electricity rate payers to landowners in neighboring states.

To achieve this, DOER needs to drop forest derived thinnings as an eligible feedstock when the RPS I changes become final and begin coordinating more closely with foresters at DCR to evaluate other types of subsidies that would promote forest policies that enhance greenhouse gas reduction strategies (e.g., incentives for production and storage of carbon in wood products and lumber, forest carbon sequestration, etc.). A coordinated policy approach can benefit forest landowners and help Massachusetts achieve its GHG goals. The current attempt to promote the use of low-grade woody materials removed in forest thinning operations is a poorly designed policy that imposes unnecessary costs on the State's citizens, provides inappropriate subsidies to out of state landowners, and works against other climate goals of DOER and Commonwealth.

2. Forest Salvage Wood

The issue of how to handle forest salvage in time of potentially rapid climate change is a complex one that DOER does not seem to have sufficiently considered. In the American and Canadian West, climate change has already contributed to massive insect infestations that have killed vast areas of forests. In the East we are only beginning to understand how we will be affected.

More specifically, the proposed changes to the regulations are unclear about the handling of forest salvage from a GHG accounting perspective. The GHG analysis tab in the revised model does not include cells for analyzing salvage wood feedstocks, although apparently DOER is proposing that these feedstocks will be handled in the same manner as Forest Derived Residues.

To evaluate the climate benefits of burning forest salvage wood for bioenergy, it is critical to have an understanding of how the carbon from dead and dying trees would be released to the atmosphere both with and without a bioenergy option—the analysis framework used by Manomet. The Manomet study did not attempt to determine such a counter-factual scenario for salvage and a recent literature search indicates very little systematic

work has been done on this topic. One paper from 2013 addresses the issue with respect to the mountain pine beetle infestation in British Columbia and found that, while bioenergy can play a role in mitigating climate change, its benefits are scenario dependent and accrue over a range of time frames. In some scenarios where salvage was the principal activity, the authors found harvesting for bioenergy created a net carbon source and was not preferable to fossil fuel from a climate perspective.[1] More generally, determining when forest salvage for bioenergy is likely to provide climate benefits is likely a complex function of biological and social characteristics. DOER presents no evidence that the state has developed science and risk-based policies to guide forest salvage policies in the face of accelerating climate change.

If the State were to conduct such a policy development process, there are a wide array of possible outcomes besides bioenergy that might prove beneficial from a climate perspective. For example, it might be the case that net carbon benefits at some sites are greater if we allow the forests to regenerate in place, slowly releasing their carbon as they decay (assuming low fire risk) rather than salvaging them for bioenergy. Or that paying landowners to let their dead trees decay naturally over time might turn out to be a cost-effective climate strategy and yield more income for landowners than what they could earn selling low-quality wood for salvage. The bottom line here is no one has yet done the work to figure out from a public policy and climate perspective how best to deal with the potentially growing forest salvage issue.

Given the general lack of knowledge about how to manage eastern U.S. forests in the face of rising climate risks, the public would benefit greatly if Massachusetts, perhaps in collaboration with other New England states, were to initiate development of a comprehensive policy study to establish ecosystem and climate informed policies for forest salvage.

But until new policy guidelines are in place, DOER should approach the forest salvage/bioenergy issue with an appropriate degree of caution. The Agency has published no estimates of how much wood might qualify across New England as salvage. The climate benefits of using salvage for bioenergy are unsupported--DOER has provided no analysis of counter-factual scenarios for salvage that would allow description of the timing of carbon emissions to the atmosphere from wood decay or fires absent the bioenergy option. And there is no analysis of alternative strategies for managing salvage materials.

In the face of such complexities and until the needed research and policy development is complete, perhaps DOER could still move forward by addressing salvage through a special permit process. Each salvage permit could focus on the climate benefits of bioenergy use of a specific harvest project relative to other potential management approaches. The process could focus on timber sales above a *de minimis* acreage threshold to ensure its practical implementability. In this way, stands that clearly pose a fire risk or for some other reason represent carbon that would likely enter the atmosphere in the near term could be directed to bioenergy recovery where burning would produce relatively certain climate benefits. But such a program in no way reduces the need for the State to conduct a more comprehensive long term policy for addressing the complexities for the bioenergy and forest salvage problem.

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[1] Lamers P, Junginger M, Dymond C, Faaij A (2013) Damaged forests provide an opportunity to mitigate climate change. *Global change biology. Bioenergy*, **6,** 44-60

3. Single versus Multi-Year GHG Approach

In the original RPS I regulations, generator facilities were required to demonstrate that they reduced emissions at year 20 by 50 percent relative to a natural gas fired power plant. The analysis is based on a single year of emissions rather than cumulative emissions modeled over 20 years. In reality generator facilities emit CO_2 every year and the emissions continue to build up in the atmosphere over time before beginning to level off due to absorption by re-growing forests. If the requirement had been that cumulative emissions had to meet the 50 percent target at year 20, the single year reduction would have needed to be around 85 percent relative to the natural gas plant. Whether the regulatory policy requires a single year or multi-year cumulative model makes an enormous difference in terms of the ease or difficulty a generator facility will have in meeting the regulatory threshold.

In the Manomet report, we initially developed the single year model as an explanatory tool. But the multi-year model is a better reflection of the reality of how bioenergy plants contribute to CO_2 buildup in the atmosphere. As a policy choice, DOER can set a target using either the single or multi-year values—they will effectively be correlated. But if understanding actual future levels of GHGs in the atmosphere is the objective, the multi-year model provides a more accurate reflection of what is happening. If DOER wants GHG levels due to bioenergy to be 50 percent of what they would be relative to emissions from a natural gas fired plant after 20 years of operation, then it would be more accurate to use the multi-year approach.

Given the Commonwealth' focus over the past decade on relatively rapid reductions in GHGs, the single year 50 percent target modeling approach for GHGs no longer seems appropriate. Use of the original model (with the revised heating value for green chips) suggests that while a relatively even mix of residues and thinnings can achieve the single year 50 percent reduction target over 20 years, such a mix would yield a cumulative reduction in GHGs relative to the natural gas plant only of only around 25 percent if a multi-year aggregation model is used. In practical terms, this means that to achieve a 50 percent cumulative reduction at the 20-year point, a generator facility will be able to burn only very small quantities of thinnings. Nonetheless, use of the multi-year model would appear more consistent with the goals of other Massachusetts GHG policies that require relatively rapid emissions reductions. In addition, it is consistent with removing subsidies for feedstocks that really provide no climate benefit in the near term (see above). While the revised model also proposed raising the target year for evaluation to year 30—the reasons for this are unclear and the change would make the rule even less consistent with the state's other GHG objectives—this does not fundamentally alter the conclusion with respect to thinnings.

Summary

These comments suggest changes in three areas that would help bring the proposed RPS 1 regulations as they apply to forest biomass into better alignment with the state's other GHG objectives. First, forest derived thinnings should be removed from the set of available bioenergy feedstocks as they provide no significant near-term climate benefits, while at the same time acting as an inappropriate subsidy transferring wealth from the Commonwealth's citizens to forest landowners in other New England states. Second, DOER has failed to demonstrate the climate benefits of adding forest salvage wood as a bioenergy feedstock and should conduct further analysis and policy development before embarking on such a broad policy experiment, particularly in light of how little is currently known about the climate benefits of using salvage for bioenergy. Third, adoption of a multi-year cumulative approach to setting the 50 percent GHG emissions reduction goal would be more consistent with other State mandated GHG emission policies than the current single year approach. Under the single year approach there is a strong likelihood of outcomes where 30 years from now GHGs from bioenergy are not substantially reduced from the levels that would have existed had we simply continued burning fossil fuels, particularly in the likely case that forest derived thinnings represent a significant component of feedstocks.

The suggestions provided here are fully consistent with the findings of the Manomet study, would result in a more transparent rulemaking, and in my view would enhance, rather than work in opposition to, the state's other GHG emissions reduction efforts.

Respectfully Submitted,

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