

# MASSACHUSETTS FOREST ALLIANCE

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Ms. Meserve:

Thank you for the opportunity to submit stakeholder comments related to the Alternative Portfolio Standard. We appreciate DOER's willingness to examine how the program is working and make changes.

We believe modern wood heat is an important part of the Alternative Portfolio Standard and deserves consideration for how to expand its use. We will discuss why this is as we answer the stakeholder questions you proposed.

### Daymark Study

Before answering the questions, a few comments on the Daymark study, which you will use to make decisions regarding the future of the APS. We appreciate the work that went into the study, and DOER's willingness to examine the program's issues in detail. However, we believe the study may be seriously flawed, and we're concerned about decisions being made that rely on the study for analysis.

The study document that was made publicly available reads more like an executive summary than a full study. Oblique references are made to how data was calculated, without any numbers shown. We believe it's important for DOER to publicly release the data associated with the study to see how numbers were calculated. Absent that, it's difficult or impossible to determine how conclusions were reached.

Trying to "reverse-engineer" how some numbers were arrived at indicates there may be problems. For example, examining the analysis for pellet boilers seems to indicate that the study significantly underestimated the amount of pellets used annually (which affects the number of AECs earned and thus the calculations), and may have ignored the fact that modern wood heating systems earn AECs for the life of the system – estimated to be 20-25 years – and instead used a shorter basis of AEC earning for calculation. We could be incorrect about this, but with all the calculations hidden and the data not available, it's very difficult to tell.

We're also confused by the O&M calculations of renewable heating systems. As an example, the O&M cost for a large pellet system (1MMBtu/hr) is listed at

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\$28,714. It's unclear what costs are included in this calculation. Annual maintenance costs for a large pellet system of that size could be up to \$3,000 for an annual cleaning and inspection. If we then add in the total annual cost of the pellet fuel used, it would approach that \$28,714 figure. Large air-source heat pumps (92 tons is the listed figure) are recommended or required by the manufacturer to have an annual service visit, and that might add up to \$500. But it certainly does not include the cost of electricity to run that system – we know that [air-source heat pumps have higher annual operating costs than modern wood heating systems](#). If a very large air-source heat pump system truly had an annual operating and maintenance cost of \$500 (including its “fuel” of electricity), it would not need to earn AECs to be economic and would make the rest of the Daymark study incorrect. It would seem that the cost of fuel was included for one system but not the others – but again, it's hard to tell because the study is so vague about data used.

Additionally, while the life of a modern wood heating system is estimated to be 20-25 years, air-source heat pumps can have half that lifespan, requiring replacement of major components which represent most of the costs of the system. Measuring over a 25-year timespan would show a substantial difference in operating and maintenance costs because the modern wood heating system would not require replacement.

The study says that it used the *Manomet* study to measure carbon impact of modern wood heating. We're curious about how this was done because the Manomet study does not analyze sawmill residues in any depth, because in 2010 that these residues were being fully utilized in paper production. Ten years later, that is no longer the case, as paper production in New England has vastly decreased. Mills are now looking for customers for their slabs (the rounded edges of the tree left over when the log is turned into square lumber) and sawdust. As a result, sawmill residues now make up virtually all of the feedstock for modern wood heating (wood pellets and chips) in APS-eligible systems. These residues, with the wood having already been cut for another purpose, have an extremely favorable carbon profile, as will be discussed further in our comments.

We were disappointed to see that semi-dried wood chips were not included in Daymark's study. We completely understand that the data was not yet available, as the market is new and essentially launched in just the last heating season. However, making long-term decisions about the APS program while willfully ignoring a major and growing component of modern wood heating seems at best unwise, especially after DOER's significant investment in this area.

Daymark found that smaller installations were generally better from a cost perspective per emissions saved than larger installations. We think that for larger thermal users, semi-dried chips would break this pattern, as they represent a heating cost equivalent to oil at 50 cents a gallon, a substantial savings over oil systems and even larger savings compared to propane systems. We believe the data will show that for larger commercial installations, semi-dried chips are the most economical choice for renewable thermal of any stripe – including air-source and ground-source heat pumps. Large modern wood heat systems have a significantly lower capital cost than larger ground-source or air-source heat pumps,

and their low-cost fuel offers additional savings over expensive electricity. Add in the extremely favorable carbon savings from the use of sawmill residues to produce the semi-dried chips, and the math becomes even more compelling.

Converting large oil or propane thermal users to semi-dried chips could have a substantial decarbonization impact *and* offer users a significant savings on fuel – something that other renewable thermal systems cannot offer. And from a decarbonization perspective, converting large thermal users has a bigger bang for the buck than even a large number of smaller residential conversions. The only issue is the high capital costs for these large systems (much lower than heat pumps, but still substantially more than fossil fuel systems).

We are also concerned that all modern wood heating systems are classified as intermediate or large size. This is unrelated to actual system size, and instead is an artifact of a regulatory shortcut because modern wood heating systems were ineligible for pre-minted AECs, and instead earn over the life of the system. With Daymark's research indicating DOER should focus on small thermal systems, this would have the unfortunate impact of eliminating modern wood heating from additional incentives, despite its decarbonization impact. We think this would be unfair and inaccurate as related to decarbonization.

We encourage DOER to publicly release data used in the study, and to take a closer look to make sure data related to modern wood heating wasn't captured incorrectly in the study, resulting in errors.

In all of our following responses to DOER's stakeholder questions, we will only be referring to modern wood heat in the APS, not other technologies.

*1. What are the benefits of the APS program to ratepayers, including but not limited to economic, environmental, and societal benefits?*

There are substantial benefits to ratepayers with the inclusion of modern wood heat. From an economic perspective, modern wood heating offers substantial cost savings to users, particularly lower-cost semi-dried wood chips used by larger commercial installations. Many end-users are in locations without access to low-cost natural gas and are relying on more expensive oil and propane. Once past the initial high capital cost for the equipment, the ongoing fuel costs are extremely low and users benefit even further from AECs.

Additionally, moving to all-electric heating and transportation would require massive grid upgrades in rural Massachusetts, where three-phase power is absent from many locations. Utilities have quoted prices of **\$300,000 per mile or even more** to upgrade to three-phase power in rural areas. This cost would be charged to ratepayers, driving the Commonwealth's electric rates (already among the highest in the nation) even higher. Modern wood heating will never be the primary heating source for most Massachusetts residents, and we're not arguing that it should be. It can be, however, a terrific complementary heating source in rural areas where it would be cost-prohibitive to upgrade the electric grid – saving ratepayers significant money.

From an environmental perspective, modern wood heating provides a significant decarbonization benefit. Modern wood heating systems [have a lower net carbon impact than air-source heat pumps using today's fossil-fueled grid electricity](#), meaning they offer a larger decarbonization impact immediately. Peer-reviewed published studies have found at least a 50% immediate carbon footprint savings compared to fossil fuels - even to natural gas - as reflected in the chart linked above.

The fact that sawmill residues make up essentially all of modern wood heating fuel improves the decarbonization impact even further. Even Bill Moomaw, one of the leading opponents of biomass energy and forest management in Massachusetts, publicly stated at a Massachusetts Forest Forum sponsored by EEA that he had no issue with using sawmill residues for heat, as the carbon savings compared to fossil fuels were so impressive.

From a societal perspective, modern wood heat offers many benefits. Modern wood heat keeps dollars paid for heat circulating in the local economy – in contrast, 70% or more of comparable fossil fuel heat dollars are immediately exported out of state. Modern wood heating promotes jobs in the forest economy – by aiding sawmills with a market for their residues and a ripple effect radiating out to foresters, timber harvesters, forest landowners, equipment dealers, mechanics, manufacturers, and those selling, installing, and maintaining modern wood heating systems. Even better, most of these jobs created are in rural Massachusetts, which is struggling economically and being hollowed out by population loss, in some cases with higher poverty rates than even the gateway cities.

## 2. What are the costs of the APS program to ratepayers, including but not limited to economic, environmental, and societal costs?

The economic costs to ratepayers for modern wood heat are minimal, as the biomass thermal component of the APS is so small. Even in a best-case scenario, the AEC payments to users would be a trivial fraction of the total program. As stated earlier, modern wood heat instead offers potentially significant economic *benefits* to ratepayers by helping avoid expensive grid upgrades in rural areas.

Environmental costs are also minimal. Many anti-wood heat voices have pointed to air pollution as a reason for their opposition. However, an air-sampling study around schools using modern wood heating pellet boilers conducted by UMass Amherst found that emissions from these pellet systems were comparable or lower than the oil systems they replaced and were likely less toxic. Adding an electrostatic precipitator can remove 98-99% of all remaining particulates. We believe it would be valuable for MassCEC or DOER to offer incentives to install ESPs or other emissions control devices to entirely eliminate this concern.

As stated earlier, modern wood heating fuel is made up nearly entirely from sawmill residues. As a result, worries about “liquidating forests” to make the fuel (which were always nonsensical) are eliminated. And as stated earlier, this fuel offers significant decarbonization benefits.

There are few, if any, societal costs. As stated before, there are significant societal benefits as people switch to modern wood heating from fossil fuels.

3. Do you believe the APS program should prioritize technologies which provide the most benefits, such as greatest greenhouse gas emissions reductions?

We do. We've recommended DOER incorporate a **Carbon Conservation Index** that would further incentive the technologies that offer the most significant decarbonization benefits. De-emphasizing gas-fired CHP systems would not only help rescue the value of AECs but would also reduce the least-effective decarbonization technology in the APS.

We are concerned, however, that the Daymark study does not present the full picture related to modern wood heating (as explained above), and basing decisions on modern wood heat on the study would result in significant error and a missed opportunity for further decarbonization, particularly for larger users.

4. From 2015 through the present, what have been the average quarterly Alternative Energy Certificates (AEC) sale prices?

Our understanding from our members who have installed these systems is that they have varied from nearly \$20 to less than \$2. This volatility is a real issue for those hoping to secure loans to cover the capital cost of their systems. Banks simply won't factor AEC income into the loans because the value has so dramatically fallen over time.

5. Is the current APS minimum standard and the annual rate of increase adequate? Please include details and any data supporting why or why not, where possible.

Clearly not, as there is a significant market oversupply. We've seen suggestions to use the mechanism contained in the recent Clean Peak Standard to avoid issues around oversupply by raising the minimum standard to compensate. We would support such a measure, and it would help prevent the current situation from occurring again in the future.

6. Do you anticipate a growth or decline in the supply of AECs in the APS program over the next 5 years? 10 years? If so, how would you quantify this increase in growth rate? Please include details and any data supporting your conclusions.

This depends on the action DOER takes now. Clearly there has been an oversupply of AECs as a result of excessive gas-fired CHP systems. Reducing that oversupply would restore value. Over time, the program should grow, and in fact must, if the state is to meet its ambitious decarbonization goals. But this will require program changes and changes outside the APS as well.

7. Are there modifications to the APS program that could be made to reduce the volatility of the APS market?

There are. DOER could set a price floor that AEC values could not drop beneath. That would stabilize the value and prevent the crash we've seen recently. This would also make banks much more likely to lend for these renewable heating systems, as prices would be reliable –

in their loan analysis, banks would know that AEC values could not drop below a certain level.

As stated above, using the mechanism contained in the recent Clean Peak Standard to avoid issues around oversupply could also help stabilize values.

8. Has the APS incentive had an impact on the decision of system owners to invest in APS eligible technologies? Why or why not.

It has. When AEC values were high, they were a significant contributor to the ROI calculations for those businesses and residents that were considering switching from fossil fuels to modern wood heat. As the AEC market cratered, those calculations have changed, and it's no longer appealing to make the switch. Restoring the value of the credits will help re-incentive switching to renewable heat.

However, the high initial capital cost of renewable heating systems is still a barrier. In the past this was addressed with installation rebates from MassCEC, but those have vanished. As modern wood heating systems do not receive pre-minted AECs but are instead paid over the life of the system, there is not enough up-front assistance to ensure that purchasing these systems makes economic sense. We are in desperate need of a return to installation rebates or some other incentive to defray the high initial capital costs.

9. How could the APS program be improved to better influence residential or commercial purchasing behaviors?

As stated above, reducing oversupply by de-emphasizing gas-fired CHP, setting a price floor for AECs, adding a mechanism to permanently address oversupply, and increasing incentives for technologies that more effectively decarbonize would all help restore the value of AECs, and encourage people to switch.

As we've said, however, this won't be enough to encourage switching to modern wood heat. Some other program to defray these high initial capital costs is still needed.

10. Are there currently eligibility criteria in the APS program that you believe are a barrier to participation in the program? How would you address these barriers?

We're not sure that there are necessarily barriers to participation. However, we do have suggested changes to procedures and criteria (see below).

11. What revisions to the existing APS eligibility criteria would you propose to improve and simplify the APS program, if any?

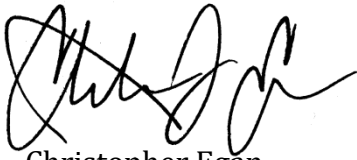
We believe further simplification is possible. We've been told by certified eligible biomass fuel suppliers that it would be easier if they could submit the fuel consumption amounts directly to DOER (and to credit aggregators). The suppliers know precisely how much fuel they have delivered and it would eliminate additional paperwork by the end-users, which might make adoption more likely, as it would lift an additional burden off of them. It is our understanding that this is how the process works for biofuels in the APS.

12. Is there any additional information you believe DOER should consider in its 2020 APS Minimum Standard Review?

As we've said above, we're concerned about errors and the limited scope of the Daymark study. We think DOER should attempt to investigate semi-dried wood chips because their significant benefits become apparent with even cursory study. We believe data used in the study should be publicly released, and DOER should take a closer look to make sure incorrect information was not used in the study related to modern wood heating.

Thank you again for the opportunity to comment.

Sincerely,

A handwritten signature in black ink, appearing to read 'Chris Egan', with a stylized, cursive script.

Christopher Egan  
Executive Director