25 September 2024

Re: 23-2220-RULE, Proceeding to Design the Potential Clean Heat Standard – Comment on Emissions factors and Climate Impacts of Woody Biomass

Public Utility Commission and the Clean Heat Standard Technical Advisory Group:

I write to you as a working-class Vermont resident who is deeply concerned about the impacts of climate change on our state and Vermont's actions to mitigate climate pollution. I have been following the development of the potential Clean Heat Standard through the PUC process and direct my comments here at how the CHS would address emissions from woody biomass.

The TAG must use the full EPA emission factor for wood without modification. Every gram of carbon dioxide emitted from burning wood worsens the climate crisis, and it is inappropriate to use a blanket "emissions factor" that would make some of this carbon not accounted for under Vermont's Clean Heat Standard, especially without a detailed, peer-reviewed scientific justification. Specifically, it is completely unjustified to use the 0.32 emissions factor suggested in the Opinion Dynamics study.

As has previously been noted to the TAG, The Opinion Dynamics study is not a rigorous, peer-reviewed scientific report, and it has numerous flaws that make its conclusions invalid for the purposes of assigning an emissions factor to wood burning. The Opinion Dynamics study wrongly describes the species mix of Vermont's forests (Vermont is majority hardwood, not spruce and pine, and few Vermonters use spruce and pine as fuel anyway), it fails to account for the lower efficiency of wood-burning devices compared to fossil alternatives, and it wrongly assumes that forests which are not harvested for fuel will cease to sequester more carbon. Even more worryingly, the Opinion Dynamics study uses a *100-year* timeframe for assessing the climate impact of wood burning emissions, which is not in line with scientific consensus or Vermont statutes — scientists are clear that we need to reduce atmospheric carbon *now* to avoid irreversible climate tipping points, and Vermont has mandatory emissions targets in 2025, 2030, and 2050, far sooner that the 100-year timeframe. In the absence of clear and scientifically sound justifications for any other approach, the TAG must use the full EPA emissions factors for wood and count all the emissions from wood burning.

I also want to address comments made last week to the TAG by Molly Willard of the Department of Forests, Parks, and Recreation, who stated that all fuel wood burned in Vermont is "waste" wood, and that the IPCC considers wood-burning carbon neutral. Both of these claims are misleading with regard to the discussion of counting wood's climate impact in Vermont. The IPCC does not consider wood burning to be carbon-neutral. It states clearly that "if bioenergy production is to generate a net reduction in emissions, it must do so by offsetting those emissions through increased net carbon uptake of biota and soils. The appropriate comparison is then between the net biosphere flux in the absence of bioenergy compared to the net biosphere flux in the presence of bioenergy production. Direct and indirect effects need to be considered in calculating these fluxes." In Vermont's case, it is indisputable that our relatively

young forests would continue to grow and sequester more carbon in the *absence* of bioenergy harvests than they would if bioenergy harvests increased. Neither Molly Willard nor Opinion Dynamics made this comparison that the IPCC calls for, or adequately evaluated "direct and indirect effects."

Terms like "waste" and "residues" are industry terms that can refer to any trees or wood that are not valuable enough to be harvested for high-value products like sawlogs and veneer. It is an economically-defined concept that has no relevance to the climate impact of burning that wood, the ability of those trees to continue growing and storing carbon, or the importance of those trees to wildlife and other ecosystem functions. One only needs to look at any Vermont cordwood production operation to note that they are processing entire living, relatively large diameter trees. Similarly, a 2017 study (attached) noted that the majority of wood pellet production in the region is from whole trees, not limbs/tops or sawmill residues. Even limbs and tops harvested from trees already going to another use (e.g. sawlogs) are not a climate-favorable fuel, because such "whole tree harvesting" leads to major carbon losses from the forest soils (see linked meta-analysis). According to the legislature-commissioned Biomass Energy Development Working Group final report, Vermont cuts roughly 1.2 million green tons of high-value products (sawlogs and veneer) and 1.5 million green tons of lower-quality wood each year, and that over half of the "lower quality" wood is for firewood. It is absurd to imagine that this quantity of "low-quality" wood is coming from anything but whole trees harvested for the purposes of filling these low-quality markets like fuel. While there may be some wood fuel production from legitimate residues like sawmill waste that have a somewhat more favorable climate profile, these sources of wood are already fully utilized and cannot be included in a model for incentivizing *additional* wood heat under the CHS. Any additional wood heat that the CHS incentivizes would overwhelmingly come from whole trees being harvested for that purpose, and any models that the TAG uses for wood-burning must acknowledge this reality.

For more information, please review this meta-analysis of 238 peer-reviewed publications showing that removal of forestry residues for combustion leads to major soil organic carbon losses and two papers (Booth, 2018; and Holtsmark, 2013) laying out appropriate ways to approach accounting for emissions from wood burning. All of these should be important resources for the TAG to better understand how incentivizing additional wood burning under the CHS would impact our climate.

Sincerely,
Chris Gish