

July 3, 2024

Suzanne MacDonald, Chair  
Board of Directors, Efficiency Maine  
168 Capitol St Ste 1, Augusta, ME 04330  
Re: Support for Pellet Heating

Dear Chairwoman MacDonald:

For the life of me, I cannot fathom how Efficiency Maine got to the point of discounting renewable pellet heat. It is improper to measure and make judgements based on the emissions of high efficiency, low emission wood pellet fired boilers and furnaces (which heat residential and small commercial spaces) while ignoring the emissions of combustion driven, large scale electrical energy production.

While listening on a Zoom call the other day, this absurdity came to me, so here I try to help others see this as well. And I believe that with better understanding, you will realize the fallacy of the policy as currently proposed.

Taking my boiler at home as an example: My boiler is a 109,000 BTUH pellet fired machine that, (EPA certified) emits only .0068 pounds per hour at full power. And while doing this, it is operating at 83.7% efficiency. Per hour of operation, it consumes just 28.55 pounds of wood pellets. 28.55 pounds of fuel putting a full 109,000 Btu of heat directly into my home. 100% efficient, no. But other than the 15% of heat lost up the chimney, the rest is inside the “envelope” that I call home.

While I was on the call that I mentioned, I looked up the power mix for New England, real time. It was 63% combustion derived. This is a common number, I look often. There was a mix of natural gas, wood, refuse, landfill gas, and methane. But undeniably 63% combustion based.

In all honesty, I am not as scientifically sure of the exact emissions profile of these giant boilers as I am for my pellet boiler. It seems they are not as tightly regulated as the boilers in homes for some reason, but it is somewhere around 33 to 45%. Yes, that is quite a spread. It depends greatly on the type of plant. Combined cycle plants using natural gas as a fuel source coming in at approximately 45% efficient (U.S. Energy Information Administration, independent statistics and analysis) and a straight steam generator plant also burning natural gas coming in at only 33% efficient. So, any way you cut it, you are consuming carbon at a 2X rate to make the same amount of heat energy. Yes, natural gas burns about as clean as it gets, but the thermal waste and pollution from burning twice as much as necessary seems absurd.

My point is that there is no questioning that converting carbon into electrical energy by means of combustion and generators, just to turn around and change the electrical energy back into BTUs and incurring the relatively low efficiency of these plants, seems naive at best. Oh, and electrical transmission lines are also a point of loss. The U.S. Energy Information Administration estimates a 95% efficiency of getting the electrical energy to the point of use. 95% of the (best case) 45% plant efficiency leaves you with 42.75% efficiency by the time the energy gets to your house.

My boiler, running at 83.7% efficiency suddenly looks pretty good, coming in at essentially twice the efficiency of the big power plants.

OK, so there are emissions either way, right? The big plants quite obviously have their place. I don't burn wood to operate my router, nor do I burn wood to light my house or run my television. But I sure as heck heat my home with wood! And there is no doubt, if you look at all of the pieces of this puzzle, that I am converting a lot less carbon into CO<sub>2</sub> and a lot less of whatever else is emitted than when we burn natural gas in these enormous quantities that power plants consume.

Making 109,000 BTUs with my pellet fired boiler puts 0.0068 pounds of particulate into the air per hour and 28.56 pounds of CO<sub>2</sub> in that same hour.

The large-scale plants put out (this is not as exact as what I know about my boiler), approximately 1 pound of CO<sub>2</sub> per kWh generated, again – best case. It takes 31.95 kWh to make 109,000 BTUs. That's right, around 32 pounds of CO<sub>2</sub> vs. my boiler at 28.56 pounds for the same energy into my house.

Yes, the COP of heat pumps changes this picture distinctly, when it is warm enough outside. But to completely discount the energy and environmental efficiency of renewable wood pellet fired devices, while burning literally twice as much carbon, plus the unnecessary thermal pollution to get the same job done is exactly the absurdity that came to me while on that Zoom call.

Think about it, before your final policy becomes another environmental mistake.

These high quality, low emission, efficient, and long-lasting home heating appliances burning renewable wood pellets clearly have a place in the portfolio of Efficiency Maine.

Sincerely,

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