

Nixon, Elizabeth

From: Charlie Niebling <cniebling@pelletheat.com>
Sent: Tuesday, February 26, 2013 1:32 PM
To: Nixon, Elizabeth; Ruderman, Jack; Amidon, Suzanne
Cc: Ray Albrecht
Subject: Alternative to Metering - Thermal RPS

Liz, Jack, Suzanne:

If the PUC staff determine that your authority allows you to consider thermal energy output estimation/verification protocols that do not require utility grade metering, here is a very simple, three-step approach that we believe will provide an accurate and consistently underestimated measure of heat output, and that can be independently verified:

- 1) Use default boiler seasonal efficiency values that err on the low side for biodiesel, pellet, chip and logwood-fired systems. Conservative efficiency values ensure that this protocol will not result in overestimation of qualified thermal energy output.
 - **For biodiesel-fired and pellet-fired boilers, use a seasonal value of 65 percent** (most boilers will achieve a real world efficiency up into the low 70s or even higher).
 - **For chip-fired boilers, use a seasonal value of 55 percent** based on higher heating value (HHV) since moisture content will likely be 40% (green).
 - **For large logwood-fired boilers, if such were to participate in the program, use a 50 percent default value** - the penalty compared to pellets/chips would be more a function of variability of heating value of cords of wood (volumetric vs weight) than difference in boiler efficiency.

- 2) Use liquid fuel metering of biodiesel-fired systems (easy to do) as primary input measurement plus fuel purchase/inventory records as confirming means of input measurement.

Use purchase records for biomass, plus beginning/end of year (or quarter) inventory estimates, to determine biomass input.

- 3) Require stack loss efficiency tests once per year within range of 50 to 100 % load conditions - such indirect efficiency numbers need to be at least five points higher than default value to provide cushion for jacket losses, cycling losses, etc. Stack loss test to be performed by qualified individuals as defined by NHPUC.

Efficiency test would provide quality control/assurance re: actual results vs claimed values.

Total qualified thermal energy output is then derived by multiplying thermal efficiency x total volume of fuel used, with standard energy content of fuels in btu's converted to kilo-watts-hours to provide data in units consistent with statute.

Facility owners could alternately use direct input/output thermal metering with approved meter technology if they wish to get credits for higher efficiencies.

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