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Keeping Score

BY DAVID SPINDLER

We buy boilers to provide water consistently at a specified temperature. That's their core function. Sound simple? If this function is so important, why not measure how well biomass boiler plants accomplish this fundamental task?

DCM Logic has developed a simple and straightforward way of doing this: Compute the percentage of heating time that a biomass plant produces water greater than the set point minus 2.5 degrees Celcius. (If the plant generates steam, use pounds per square inch (psi) greater than or equal to set point minus 1 psi instead.) Add in the times when the biomass plant can't make this temperature (or pressure) goal, but all biomass boilers are working at greater than 95 percent modulation. (Undersizing is a rational design decision, and there's no need to penalize it.)

We call this Boiler Plant Effectiveness, or BPE. Expressed mathematically, that's BPE equals percent of heating time when water produced by the biomass boiler plant is equal to or greater than the set point minus 2.5 degrees C, or modulation of all biomass boilers greater than 95 percent. For "water produced by boiler plant," use the storage tank top temperature. If you don't have a tank, use the water temperature exiting the biomass boiler plant, before any mixing is done.

This formula isn't proprietary to DCM Logic—one can try this at home, or in the office, or at a nearby boiler plant.

One can calculate it on his or her own with just a spreadsheet. For longer periods of time, one may want to enlist the help of a controls contractor or boiler manufacturer. DCM Logic can help as well. It's the only way to really know and quantify how well a biomass boiler plant is doing its primary job.

You may wonder how BPE relates to efficiency and emissions. It doesn't. A higher-performing boiler plant will generally use MORE fuel than a lower-performing boiler plant. Efficiency is nice, though focusing on it exclusively is a bit like asking which participant in an athletic competition burned the fewest calories. Times or scores in the event are far more important, as they are the performance measure that separates the competitors.

Clean, green, local, and cheap (sometimes!) are just dandy, but they're not enough to take biomass heat from niche to mainstream. We also need to keep score, and let the world know how well biomass heat works.

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