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Richard Karney, PE
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Dear Rich,

My short comments:

1) Under no circumstances should whole house tankless electric water heaters receive any EnergyStar classification. Not only are the capacity concerns you describe relevant, but a host of other issues: utility morning peak loads, localized transformer overloading and reduction in MTF and neighborhood voltage drop. I have some background on these issues if you need them. They go unmentioned in your analysis. That said, tankless gas water heaters can be quite efficient and do not have these concerns and seem appropriate candidates for EnergyStar as you indicate.

2) The analysis should clearly outline that the energy use and savings levels in your analysis document are tied to the DOE test procedure, which often is not appropriate in warmer climates. For instance, as I recall it the DOE procedure assumes a 135 setpoint, 58-degree inlet water temperature and 64 gallons per day. In Florida, our mean measured set points in a large statistical sample is about 120 F and our average inlet water temperature is close to 75 F (see Figure 6 in the first attached document). Also, the volume of average hot water consumption is closer to 50 gallons per day than 64 gallons. Thus, our average measured annual UEC for electric resistance water heaters was only about 2,300 kWh in Central Florida-- very different from what you have in your examples. Please see the attached paper, which looks at this issue in some detail.

As EPRI has known for some time, daily household hot water use has gone down with household size and more efficient appliances. Also, the inlet water temperature will trend closely to the average annual air temperature in a given location plus a few degrees (see recent NREL paper on this topic). Also, I believe that hot water heaters are now shipped with a setpoint of 120 F and not 135 F. These caveats should clearly be called out in your document as using the DOE test procedure assumptions will only result in appropriate water heating loads in locations where the average annual temperature is around 56 F (e.g. Philadelphia) and for households with heavy hot water use. Otherwise, savings from the various technologies will be exaggerated, particularly for warmer climates.

Regards,

Danny Parker
Florida Solar Energy Center