Equipment Sizing

Another factor that has not been included in this discussion is equipment sizing. It is not a rare case for designers to oversize the DHW heating boilers, which results in decreased energy performance at lower level of the partload curve for the majority of the operating period. To avoid such inefficiency, design engineers and energy modelers should work together on predicting the DHW load more accurately during the design stage.

CONCLUSION

It has been proven from the simulation results and meter data that DHW energy consumption is a very important component in muti-family residential building energy modeling.

Huge discrepancies occur in the DHW demand and daily profiles provided by the various standards. As a result, they have a significant impact on DHW energy consumption.

ASHRAE 90.1-1989 (ASHRAE 1989), MNECB (MNECB 1997) and LEED (CaGBC 2009) methods provide relatively accurate DHW demand estimation when low flow fixture is not taken into account. ASPE 2 method can be trusted if the right occupant category is picked from its guidelines.

ASPE DHW profile (ASPE 2003) is the best matched DHW profile in three sets of profiles, therefore it is recommended to be used for future energy simulation.

The impact of condensing boilers and low flow fixtures on DHW energy consumption is also important. It is quite necessary to include low flow fixtures in current design handbooks, manuals, and codes.

It is very urgent to update commonly accepted handbooks, design manuals, and codes with more current DHW studies. These current DHW studies should reflect more recent meter data, allowing users to predict the DHW usage more accurately in energy modeling and equipment sizing.

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