Jerrad Pierce, NMR Group

Poster Title: EF, MEF, and IMEF, Oh My!

Abstract: This poster will address the question of how to account for older equipment of unknown efficiency or efficiency reported in deprecated units when conducting analyses with modern software or a sample of mixed vintage.

Evaluation work frequently requires searching for efficiency details of specific models of lighting, appliances and HVAC equipment. While information is often publicly available, there is no comprehensive repository. This means that analysts must comb through data maintained by a variety of different stakeholders and purveyors, all of whom use different tools with distinct features. This can make extracting the desired data tedious and costly. In addition, data sources are often incomplete due to the frequent archiving of older models. Finally, when efficiency standards and specifications are revised, not only are permissible levels tightened but sometimes the regulated units change as well. For example, in the past two decades clothes washers have switched from energy factor (EF) to modified energy factor (MEF) and then to integrated modified energy factory (IMEF). How should one account for older equipment of unknown efficiency or efficiency reported in deprecated units when conducting analyses with modern software or a sample of mixed vintage?

The authors have developed an internal equipment efficiency data warehouse drawing on sources such as the EPA's ENERGYSTAR Product Finder, AHRI's Certification Directory and the California Energy Commission's MAEDBS, as well as direct observations from field studies. We are using this archive of hundreds of thousands of devices to explore summary statistics of equipment efficiency by ENERGY STAR status over time, compare these to federal minimum standards, and assess whether average efficiencies or federal minima are a better proxy for missing data. This analysis may also reveal if there are standards which lag behind manufacturers' abilities. Finally, we are deriving conversion factors for altered efficiency standards of clothes washers & dryers, room air conditioners (RACs), and water heaters, and comparing these to the few official conversion formulae available for these equipment types. Preliminary results suggest that CEER and EER ratings for RACs may be treated as equivalent for legacy equipment.

The database has already been compiled and the analysis is underway. The results will be ready by March 2019. The findings will be brief but of immediate use to evaluators working on studies that address any of these equipment types. The poster will feature numerous charts, particularly histograms and scatter plots, to help viewers interpret the analysis.