Terese Decker, Navigant

Poster Title: Taking the Long View: Insights from a Longitudinal Saturation and Load Research Study

Abstract: A statewide residential saturation and load research measurement project is now in its third year of data collection. By May 2019, the team will have analyzed two years' worth of data which allows interested parties to understand the change in saturation and load shapes year over year. This poster would communicate the findings from this study, plus the value of conducting a longitudinal panel study of this nature.

The data collection team has collected saturation data from 6,500 statewide residents in a sample that is statistically significant across several demographics. The first survey was administered online in the spring of 2017. This survey asked respondents about the presence, quantity, and characteristics of over 100 end uses. The results, finalized in August 2017, showed that the equipment stock in the state had changed since the last statewide Residential Appliance Saturation Survey (RASS) had been finalized in 2009. However, because the two saturation studies used different data collection and analysis methods, the team was unable to measure the true change between 2009 and 2017. With that in mind, the program administrators decided to extend the data collection period to ask the same respondents about equipment changes in their homes in the last year via an online survey with the same overall approach. This allowed the team to minimize error related to methods and focus on insights gained from the research, such as the explicit measurement of stock and flow of equipment and the adoption of emerging technologies. Additionally, maintaining a robust panel with various significant demographic groups provides a population of non-participants to use as subjects for future research efforts, such as seeking to understand barriers to program participation. By utilizing email recruitment, this effort has not added significantly to the overall cost of the study.

Within the survey sample, the team recruited more than 350 sites to participate in the metering portion of the study. At these homes, field technicians characterized and metered the energy usage of 25 key end uses in the homes. The meters were installed in the spring of 2017. After one year of data collection, the evaluation team was able to develop annual load shapes for all end uses, specifying annual energy consumption and peak demand during multiple peak periods. After two years of data collection, the team can compare the load shapes over multiple years to illustrate the impact of different weather events and how the changing energy landscape affects the load.

At a minimum, the poster will graphically depict:

- Saturation, characterization, and load shape results for key end uses for each year of measurements
- Impacts on the load shapes due to extreme weather events compared with mild weather
- Stock and flow changes after one year

Optionally, the dynamic dashboard of results from this study could be displayed during the poster session for attendees to explore. From this poster, the evaluation community will be able to quickly understand the results of this rigorous study and the value of conducting a longitudinal study of this nature.